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THE RELATION OF PRECORDIAL PAIN TO HEART DISEASE.*

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CHICAGO.

When we allude to precordial pain as a subjective symptom, we are likely to do so without definite intention and to neglect certain features of its manifestation which are important in a differential sense.

The importance of precordial pain lies in the fact that it may be indicative of serious lesion of the heart or great vessels or, again, may be of comparative innocence.

Behan maintains that hyperalgesia of certain areas, usually precordial, may mean heart disease even though other signs of such condition should be absent. Many clinicians have objected to such an interpretation of areas of referred pain when unassociated with other evidence of cardiac disease even though the weakness of the negative evidence of absence of such zones be admitted. We shall have to admit that areas of hyperalgesia or of pain, when unassociated with or produced by other cardiopathic factors, must be very carefully observed before we can assume that they are directly indicative of organic heart lesion.

In 1873 Loomis called attention to the fact that pain associated with heart disease might be referred to points remote from the precordial region. This fact was later elaborated by Head and Mackenzie. Morgagni recognized pain as a subjective evidence of heart disease, and Laennec pointed out that the painful areas were also tender.

As the heart is not a particularly sensitive organ, there will be no pain exhibited in connection with mural or valvular lesions except when such sensory filaments as may exist in the endocardium are irritated by the acute phase of an endocarditis, by hyperventricular tension, or when normal blood supply is in some measure interrupted. We are, therefore, obliged to implicate the cardiac nerve supply and its associations with spinal nerves, pneumogastric, brachioplexus, etc., as elaborated by Lussana, Sturge, Ross, Mackenzie, Head, Gaskell, und others.

That precordial pain is referred and not local is shown by the fact that it has no constant relation to the condition of the valves or the musculature of the heart, the cycle of the heart's action, or to the contact of heart and chest wall. Many different factors may be involved, as is shown by the views offered in explanation, such as ischemia of the heart muscle (Burns, Potain), relative dynamic failure (Parry, Brunton), neuritis (Lancereaux, Peter), vasospasm (Landois, Nothnagel), spasm of the heart itself (Heberden, Latham), spasm of the coronary vessels (Huchard), hyperesthesia of the cardiac plexus (Romberg); and Balfour has called attention to the fact that functional deterioration of the nerves from malnutrition and chronic disease is an important factor in exaggerating the effect of the various factors enumerated above. Toxic, anemic, or degenerated blood is also a recognized factor in increasing the importance of other pain producing causes.

Organic changes in the heart and great vessels are, in the majority of instances, responsible for the pain. Nothnagel showed that in 483 cases of valvular disease, analyzed in relation to pain, that pain was present in aortic lesions of various types in from 18 to 68 per cent., while mitral lesions showed only from 8 to 18 per cent., in which pain presented. The fact that the structures of the left side of the heart are connected with the left coronary and left deep cardiac plexuses, and along with the superficial plexus with the left nerve centers, accounts for the great

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frequency of left-sided pain in cardiac disease.

Greater pressure effects in the left heart and aorta, together with greater frequency of degenerative changes in the coronary vessels of the left heart furnish a direct etiology for the association of pain with aortitis and valvular lesions. As far as the diffusion areas of the tenderness is concerned, we may recall that Head has said: "The sensory and localizing power of the body is enormously in excess of that of the viscera, and thus, by what might be called an error of judgment, the diffusion area is accepted by consciousness, and the pain is referred to the surface of the body instead of to the organ actually affected."

In aortitis it is probable that there is no pain until the adventitia of the vessel and the neighboring cords of the sympathetic become involved with implication of the aortic and celiac plexuses. While Potain believed that inflammation of the arterial wall alone would cause pain, clinical evidence seems against this view, and it is not in accord with the beliefs of Buch, Flourens, Debove and Letulle, and many others.

Buch explains paroxysmal pain by postulating hyperalgesia of the neighboring sympathetic cords, excessive function of the suprarenals which raises blood pressure by contracting the superficial vessels, the result of this on the stiff, large vessels is pain. This is followed by reflex dilatation and relief of pain. We might cite, as an analogous condition, Raynaud's disease and intermittent claudication, in which we have spasms of pain, depending on more or less constant obstruction of the circulation plus intermittent spasms of the vessels supplying the part.

According to Behan the cutaneous areas of hyperalgesia in heart disease are those tributary to the cord segments extending from the eighth cervical to the fourth dorsal, and, in conditions of ventricular dilatation and back-pressure effects with large zones of precordial and liver tenderness, involving the seventh, eighth and ninth dorsal segments. The last cervical and first and second dorsal zones extend down the arms. These zones may only be painful in the event of associated debilitating conditions. Vagaries in the manifestations of these zones are charged against variations of embryonal development.

The psychic effect of precordial pain is most interesting. There is, perhaps, no single symptom which in itself does not necessarily indicate serious conditions that so greatly alarms the patient. He will accommodate himself to moderate degrees of dyspnea and will explain, to his own satisfaction, the appearance of edema of moderate extent, but precordial pain is something about which he desires to be reassured. His alarm is not in proportion to the seriousness of the pain, for the dolor of an organic angina may not be viewed with so much alarm as the sharp twinges of a reflex pain due to a gastritis. The quiet, intense apprehension of danger characteristic of organic angina is altogether different from the restless alarm of pseudo-angina, or of reflex precordial pain.

A young woman quite convinced of her immediately impending death, and who could not keep still long enough to permit of an examination, became so angry when assured that death was neither probable or possible at that time that she ordered me to depart forthwith.

An elderly man suffering from an attack of angina *sine dolore* said: "Doctor, I am not afraid to die, but I have the most horrible fear of something about to happen to me." A few minutes later he was dead.

A colleague, a hard-headed surgeon of steady nerve, called me hurriedly. I found him resting comfortably on a lounge. He apologized and said: "I guess I was only alarmed, but I am mighty glad to see you." A few seconds later he was dead.

Heart fear is a term used to define sensations of restlessness, oppression, constriction and indefinite pain about the precordium, generally occurring in nervous individuals. It may be associated with gastro-intestinal derangement, disturbances of cardiac innervation, high blood pressure from toxemia or over-strain, and sometimes with valvular lesions. It may be attended with areas of hyperalgesia, but if so they are not so definite as those associated with myocardial lesions, and they may present in remote portions of the head, neck or chest, in which event they are not so disturbing to the patient.

It is an established fact that pain in association with heart disease is much less frequent among the cardiopaths of charity hospitals than among private patients of higher social status, and, apparently, this discrepancy is greater than the variations in the degree of concern as to the final outcome exhibited respectively by the two classes of patients.

Some individuals who are in the early period of cardio-vascular developments—the so-called pre-nephritic period,—or who exhibit vaso-motor instability from toxic causes or overstrain, with high blood pressure, may complain of a sense of constriction, oppression, or pressure without pain or heart fear and with or without disturbances of rhythm. This is a mild intimation of a relative dynamic inability of the heart muscle, due in part at least to increased peripheral resistance, and which later, in association with aortitis or myocardial degeneration, may develop distinct cardiac pain indicative of a negative dynamic cardiac force, which pain, Musser has told us, will persist until stretching of the mitral opening gives relief to the intraventricular pressures.

The character of precordial pain may be indicative of its cause. Sharp pain, appearing suddenly and ending abruptly, may indicate myalgia, pleurisy, intercostal neuralgia, reflex pain from causes below the diaphragm. Persistent sharp pain may be from aneurysm or mediastinal growths, as likewise may be dull, boring, continuous pain. True or false angina may also begin suddenly and end abruptly, but has also distinctive features. Pain from aortitis and myocardial conditions usually has an indefinite beginning and is mostly associated with causes which raise the blood pressure, subsiding slowly and only with relief of pressure conditions by rest or medicine. Sudden, severe attacks of pain, with subsequent relief for considerable periods are to be regarded with suspicion of cardiac ischemia, which is likely to recur.

The two valvular lesions likely to show pain are aortic lesions and mitral stenosis. Pain from aortic lesions is usually at the base of the heart except when the ventricle is stretching, when it will be all over the precordial area. Mitral stenosis exhibits sharp twinges of pain about the apical region, vagrant in character, and with, apparently, no relation to the dynamic condition of the heart. These pains are frequent in nervous women with mitral stenosis, but typical angina is very rare. Nothnagel collected 1,500 cases of valvular disease, many of which showed anginous symptoms, but in only one instance was angina associated with mitral stenosis.

The location of the pain is important. In reflex pain of extra-cardiac origin the pain may be lateral or bilateral. The wider its extent the more surely it is not of cardiac origin. Referred gastro-intestinal pain is usually not above the fifth rib and is also felt behind at the lower angle of the scapula. Pain from aneurism or aortitis is located above the fifth rib as a rule and is also felt at the left shoulder and down the arms to the elbows or fingers. In cardiac dilatation the pain, as well as the areas of hyperalgesia, may cover the liver area as well as the precordial.

Ever since Laennec's observations as to the frequency of angina pectoris there has been a wide difference of opinion as to the frequency and the fatality of this affection, also as to the propriety of using the term pseudo-angina. In 1812 Latham described a group of symptoms, under the term *angina notha* as "usually, but not always, denoting angina pectoris." So far as the term pseudo-angina represents a condition not associated with demonstrable lesion, and which has a tendency to get well, we may agree with Morrison that it may be advisable. At any rate, the very frequent occurrence of neurotic forms of angina may be accepted as a reason for the very remarkable difference of medical opinions and experience in regard to angina pectoris.

The main features of pseudo-angina are its occurrence in married women, in younger persons than true angina, and a tendency to get well. Its special features: recurrent attacks, nervous causes, and, at times, remarkable persistency. Osler divides this type of angina into the neurotic and the toxic; and the former into the neurasthenic, hysteric, angina vaso-motoria of Nothnagel, and the reflex.

The pain of pseudo-angina varies remarkably in character and intensity. It has the widest range of distribution and may be referred to isolated spots (supraorbital, testicular, ovarian). It may simulate closely the pain of true angina both in character and location, but though the subject may be alarmed and excessively nervous, there is not the distinctive *angor animi* which accompanies true angina and is a marked feature even of the *angina sine dolore* of Gairdner.

In neurotic angina the pain may appear suddenly but is usually preceded by dizziness, oppression in the chest, or some ataxia in the gait, especially in the toxemia from tobacco; by gastro-

intestinal symptoms in the reflex form; by dizziness or syncopal attacks preceded by flushing, or paleness and sweating in the vaso-motor types, and by languor, weakness, tingling, prickling, or numbness of the extremities, dyspnea and various other nervous symptoms in the hysterical group.

The vaso-motor type shows greatest radiation of pain, which is usually confined to the chest, arms, head or neck but may be felt in the abdomen or lower extremities. The toxic type, especially that due to tobacco, exhibits dull, distressing pain mostly confined to the precordium or epigastrium. It is likely to be persistent rather than paroxysmal.

Coronary angina presents two main features of the paroxysm,—the *dolor pectoris* and the *angor animi*. These are usually associated, though the latter may obscure the former, which may even be absent—the *angina sine dolore* of Gairdner.

The pain of true angina is indescribable. Seneca said: "To have any other malady is to be sick; to have this is to be dying." The pain begins suddenly, as though a dagger was thrust into the heart or the chest crushed in a vise or by a gradually constricted band of iron, or a horrible weight pressed the chest wall in. Excitement may institute the pain, as with the famous John Hunter, who said his "life was in the hands of any rascal who chose to annoy or tease" him. On the other hand, Sumner would precipitate an attack of a sudden movement while reading at night, yet an exciting debate in the Senate had no such an effect.

With the onset of an attack the subject assumes a fixed position and remains more or less absolutely still until the pain ceases, being apprehensive of the effect of the slightest movement. John Hunter's nephew says that during the first attack suffered by his uncle the latter "found himself not breathing. Being afraid of death soon taking place if he did not breathe he produced the voluntary act of breathing by working his lungs by the power of his will." This illustrates the almost subconscious tendency to immobilization which is in marked contrast to the restless irritability of other forms of angina.

The pain ends abruptly, though the area of distribution may remain tender, at least the patient is apprehensive of the effect of handling the area to which the pain is referred.

The most frequent seat of the pain of true angina is, unquestionably, along the sternum or parasternal line. It may not radiate beyond the precordium, but if so the arms suffer most, particularly the left. Radiation of pain is neither as marked or extensive as in other forms of angina. Substernal pain is frequent in angina from all types of stenocardia, and the pain may be referred to the stomach or liver.

A vigorous physician of seventy years exhibited typical attacks of angina. He persistently referred the pain to the epigastrium, over which region he was also tender. His pulse was regular and strong with good heart tones. Death was sudden. Autopsy disclosed a ruptured area of myomalacia cordis about the size of a silver half dollar in the anterior wall of the left ventricle.

In many instances we have to study carefully all the factors contributory to the attack in order to determine the nature of the pain. Physical effort is often associated with an attack, yet the more difficult it is to fix any specific cause for an attack the more probable is it of the coronary type.

Angina pectoris is more likely to be associated with a luxurious, sedentary life, or with mental worry or overstrain than with physicial labor and temperance in all things. In this respect it might be classed with gout, of which Sydenham said that its victims included more wise men than fools. Heredity bears on the question to the extent of furnishing types liable to arterial degeneration and its consequences, such as the celebrated Arnold family, of England. Men are specially liable to angina because of the nature of the etiologic factors. Hunter's statistics give 237 men to 42 women. The majority of true anginas occur after the fiftieth year of life, though young persons may exhibit those types occurring from valvular disease, pericarditis, toxic, reflex or nervous causes; mental worry or grief may precipitate attacks. A young woman who had suffered repeated attacks of angina had a fatal attack shortly after an interview with her husband, who was suing for divorce. Gout, diabetes, syphilis, locomotor ataxia, specific fevers and influenza may precipitate attacks. The means found effective for relief of the attack may indicate its nature.

The more experience one has with angina pectoris the more full is the realization that it is at

times extremely difficult to interpret its character, and that only ignorance or inexperience can excuse dogmatic assertion regarding it, also that a beneficial psychologic effect is the result of an optimistic attitude of the physician in regard to the individual patient.

DISCUSSION.

Dr. Frank Billings, Chicago: Dr. Patton has so fully covered the symptomatology of precordial pain that I do not wish to take your time in speaking on that point. There are, however, some things of interest to say.

Precordial pain is not necessarily an index of organic disease of organs located in the mediastina. It may be present when there is no recognizable organic lesion of the contents of the mediastina. On the other hand, with severe organic disease of the organs within the mediastina there may be absence of pain. Thrombosis of a branch of a coronary artery, and usually this is a branch of the left artery, may cause immediate severe pain which lasts but a short time. Following this there is no pain, usually, although there is evidence of a failing heart and usually death supervenes within a few hours or days.

If one of the coronary arteries is partially obstructed and the heart muscle receives insufficient blood ischemia with consequent pain may occur. Yet the same condition may occur without pain. A large aneurism of the arch of the aorta may not cause pain. A small aneurism difficult of recognition by physical exploration may cause pain. Dr. Patton has mentioned ischemia of muscle, irritability of the nervous plexus of the heart, coronary spasm as causes of heart pain. When the pain is subjective only, one is nearly always in doubt as to its meaning. If it be objective also one may determine the character of the organic disease of which the pain is an expression. As a rule angina pectoris, which is caused by some appreciable organic lesion of the heart or its blood vessels, usually called a true angina, is excited by anything which calls upon the heart for more work like any emotion, physical exercise, etc., and the pain continues until the cause of over-heart action is removed. In true angina of severe type the patient is statuesque, disinclined to move, breathes very superficially and the pulse is small, thready and of high tension as a rule. On the other hand, angina that we call false occurs most frequently in patients who are emotional and nervous and who, during an attack, are restless, moving about constantly, the face flushed and present directly opposite conditions from those who suffer from true angina.

Precordial pain is one of the most important symptoms which the physician is called upon to interpret and he will make the fewest mistakes in diagnosis who will take the greatest pains to examine his patient, not once, but many times.

SOME PSYCHIC FACTORS OF SURGICAL ANESTHESIA.*

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Gentlemen, Fellows of the Illinois State Surgical Society: I appreciate the honor you have conferred upon me in asking me to read this paper. I do not, however, suppose that it is myself that you are particular about, but I consider your invitation to be the expression of a special interest in the department of surgery which I represent. This thought is to me most pleasing.

Again there is an appropriateness in your wish for a paper on some aspect of surgical anesthesia at this your first annual meeting. Modern anesthesia was the first discovery that made modern surgery possible. Antisepsis and asepsis came later and whether these are more important than anesthesia or anesthesia is more important than antisepsis and asepsis it is futile to discuss. To do so would be like debating which is the more important for the machine shop—steam or the steam engine. All I care to emphasize now is, that, however minute the knowledge of anatomy may be, however clean the surgery is, the number of people who today would submit to an operation if anesthesia did not exist, would be very small compared with the number who because of anesthesia eagerly embrace the opportunities surgery offers.

Once more, this emphasis placed by you upon the details of anesthesia is a part of the interest surgery takes in preventive medicine. It is for the prevention not only of pain which from the very nature of pain was sought ages before modern anesthesia was discovered. It is to prevent undue disturbance to the patient, to prevent undesirable complications on account of and during a necessary anesthesia, the prevention of undue risk to the patient by a faulty administration. And further, this recognition by a society like this of the importance of a correct administration of anesthetics indicates the advance the science and art of anesthesia is making. It is only recently that any attempt has been made, in the United States, to confer upon the administration

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of anesthetics the dignity of a specialty. The devotion by a medical man of his whole time to the study and administration of anesthetics was rare in this country until a few years ago, although in Great Britain and in Canada the professional anesthetist has been recognized for a long time. This, together with the demanding by certain states of internship in a hospital in which instruction in anesthesia is given by a visiting anesthetist, before the graduate in medicine can be granted an examination for license to practice; the numerous articles on anesthesia which now appear in medical journals; the formation of societies of anesthetists; all these and other circumstances indicate a scientific interest in anesthetic matters hitherto unknown among us. It must be borne in mind, however, that, in spite of all this the field is new. Much that is written or done is erratic, but such is only the necessary wandering in a region unexplored and therefore little known.

It is a matter of time and of earnest conscientious effort to open up and cultivate this new field of surgery and make it yield its quota toward successful operative procedures. And so as an effort in this direction let me ask your attention at this time to "Some Psychic Factors in Surgical Anesthesia."

First, however, let me say that I do not refer to direct hypnotic influence. It is true that a patient will be calmer, more submissive in the presence of one personality than in that of another. In the broad sense such a condition is indeed hypnotic in its nature, since hypnotism depends for its effect upon the willingness of one personality to suspend its own activity and follow the suggestions of another and the hypnotic state is only the realization of this passivity. Such a simple condition, however, as that of which I shall treat, is so common in everyday life, so within the power of everyone, that to dignify it by calling it hypnotism would be misleading.

The symptoms of hypnotism, in its strict psychological sense, can be made to appear in about eighty per cent of people as they come and go. This means, however, that in these people phenomena can be induced which the psychologist can recognize as hypnotic. To a layman, even to the subject himself, these phenomena usually mean nothing. For producing hypnotic phenomena which will be appreciated by the laity, the number of persons available is comparatively small. A selection of subjects must be made and a certain amount of training is necessary. Further the complete hypnotic state which can be made to involve analgesia is possible in only a still more restricted number and for actual use in surgery would require intelligence on the part of the patient, long training and consequently a pathological condition for which the operation could be postponed indefinitely.

The power which the anesthetist is called upon to exercise, belongs to hypnotism only as any phenomena in everyday life, which involves influence, belongs to hypnotism. Such are the influence the successful salesman exercises over his customers; the orator over his audience; the looker-in at the shop window over others who stop and look because he looks; of the crowd moving in a particular direction which by its movement causes you to join it. These phenomena are indeed hypnotic, but to refer to them as such in practical life would create wrong impressions. So with the dealings of the anesthetist with his patient. I shall treat of them without alluding to hypnotism.

Now in order to make my paper clear let me dwell for a while upon its terminology. Throughout I shall consider the patient's mind as it actually is when presented to the anesthetist, and in all instances all that the anesthetist has to do is to deal with it as it is. He will fail if he attempts to manage it from a theoretical standpoint and make it what it cannot be. There is one fact of great value to the anesthetist. It is that, so far as it is concerned with the anesthesia, the content of the various minds that come before him does not vary much in quality. The intensity of the ideas in them may differ but as a rule the quality does not. In order to comprehend this content let us consider briefly the normal mind.

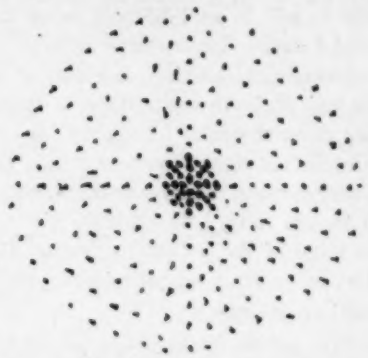
We all feel that we have present in our mind a large number of ideas. Of these we say we are conscious. As I pen this paper I am conscious of my writing materials, of the table on which I am writing, of an electric lamp before me, of some ethyl chlorid and chloroform on the table, of some of the walls of the room, of the noise of bells on electric cars outside my room and of sev-

eral other things besides the fact that I am writing. Of these I say I am conscious and I call this group of ideas *the field of consciousness*. Whether all the ideas present are equally clear and distinct is another matter. What it is essential to recognize first, is that I am possessed of a field of consciousness which may be more or less extensive or limited and that this field of consciousness is coextensive with and another name for the totality of ideas of which, at any one moment, I am more or less clearly conscious.

I notice, however, not only that there is a marked difference in the clearness and distinctness of the different parts of this field of consciousness, but that one part stands out preeminently distinct above the rest. The subject on which I am writing with my effort to reduce it to visible form especially occupy my mind. This forms a sort of center or focus of my mind. Therefore in the field of consciousness, this special point on which the mind is concentrated I call the *center or focus of attention*.

Further there are continually coming into my mind ideas of which I was not previously conscious and which have no immediate connection with my present environment. They are not due directly to sense impressions. The hissing of a locomotive outside my hotel, an idea which has entered consciousness through an auditory sensation, suggests a locomotive with its train of cars stopping at the station near my house which is several hundreds of miles distant, an idea of which I was not previously conscious. This in turn awakens the idea of the killing of a man by a train at this same station and to whom I was called after the accident. Now the closing of the gates of the elevator in the hall produce not only an auditory sensation but also reminds me of the eagerness with which I awaited the arrival of a friend, also with an accompanying chain of ideas, none of which ideas are immediately connected with my present environment. Now whence did these ideas come? Not directly from sense impression but indirectly. They were present in my mind but were not in consciousness. Some special activity called them forth from somewhere else. This region in which all such ideas are I call the *region of the subconscious* or simply *subconsciousness* and the boundary line between it and the field of consciousness I call the *threshold of consciousness*.

If now I represent diagramatically the field of consciousness by dots arranged in a certain way, the indefinitely extended blank space all around it will be the region of subconsciousness,



which by the presence of the proper stimulus will send some of its contents over the threshold to become a part of consciousness.

We note then that there is a field of consciousness which may receive new elements from a realm of ideas of which we are not conscious known as the region of subconsciousness, and when such an idea passes over the threshold into consciousness I say I *apprehend* it. If now that idea becomes the object of attention, or if any other idea assumes such special importance I say *I apperceive* it or it is *apperceived*. By *apprehension* then I mean the entrance of a psychical state into the field of consciousness; and by *apperception* I mean the stationing of a psychical state at the focus of attention, indicated in my diagram at the center of the field of consciousness by a group of dots closely placed, six on any one diameter. The number of ideas that may constitute the focus of attention I call the field of aperception or the scope of attention. Since Liebnitz, Kant and other philosophers and psychologists have used these expressions in different senses, it has been not only not useless but absolutely essential for me to make known exactly what these terms signify in this paper, if ambiguity is to be avoided.

Let me now consider in detail the psychic phenomena of patients for anesthesia and which the successful anesthetist must have clearly before him. There are several ways along which

I might lead you in doing this. I could begin with the simpler psychical phenomena and proceed to the more complex. This might be the best way were I addressing a body of psychologists whose interest in the subject is purely from the standpoint of psychology. But as it is my privilege to talk to medical men whose interest is clinical I shall consider the phenomena as they occur chronologically before and during the anesthesia and while discussing these phenomena I shall lay down the rules for controlling them.

But let me say right here, once for all, that except under certain special circumstances, which I shall explain fully, I do not believe in controlling the mind of the patient by drugs. It is always best to guide or subdue psychic phenomena by psychical technique.

The first mental perturbation of importance in anesthesia is that due to the disturbing ideas implanted in the patient's mind by friends or visitors. They seem to delight in making it appear to the patient that they have experienced exactly what is before him and they call his attention to all the real or imaginary concomitants that they experienced in connection with their anesthesia. Thus, in the mind of the patient, who, under the circumstances, is peculiarly receptive of such information, ideas are implanted, which cause him to anticipate his coming anesthesia with dread or even with fear. Even if he tries to dismiss them from his mind and succeeds in banishing them from consciousness they remain in subconsciousness to appear during the induction and cause disturbance if they are not held in check by the anesthetist.

Such ideas must be overbalanced by those that are correct and assuring. Success in doing this depends entirely on the *manner* in which it is done. If the anesthetist go directly to the patient and tell him that his friends are mistaken and explain the fact he will fail almost every time. Patients do not believe all that their nurse, surgeon or anesthetist tells them. They may have perfect confidence in them, but one element in this confidence, paradoxical as it may seem, is a belief that it is the duty of the medical attendant to conceal all detrimental information and to make only assuring statements.

In dealing with such a case then, the endeavor of the anesthetist should be to have his patient believe that he knows his business and that he has perfect confidence in his patient taking the ether well. The method should be by action not words. An illustration will make this clear.

Mrs. Smith is in bed in a ward awaiting operation tomorrow. Her mind is anxious because of the discomforting stories told her about the anesthesia. I go to the ward with the sole purpose of removing Mrs. Smith's fears. As I enter I apparently do not notice Mrs. Smith but go to Mrs. Jones' bed, which can be clearly seen by Mrs. Smith and I examine Mrs. Jones in whom I have no interest, taking care that Mrs. Smith sees me. I start as if to leave the ward and as I pass Mrs. Smith's bed I turn apparently in surprise to see her there and then go and converse with her on any subject except the anesthesia. I leave without mentioning it. When, however, I am about to leave the ward I return to Mrs. Smith and say, "Mrs. Smith, I think I'll tell you that while we were conversing I looked you over and tomorrow you are going to take the anesthetic well." The train of reasoning I thus set up in her mind is this: That doctor is going to give me the anesthetic tomorrow. My friends tell me it is disagreeable and dangerous. If it were so and were I going to do badly under it, doctor would have said nothing to me about it. Since, however, when he was not obliged to tell me about it, indeed did not know I was here, he came back and told me I would be all right, I think I will be for he knows more about it than my friends do." Thus all these detrimental ideas have been removed and assuring ones substituted.

A second source of mental disturbance is the waiting by the patient for the anesthesia after he has been told the anesthetist is ready, or has been removed from his room for it. During this time all sorts of ideas form in his mind and, however false or grotesque they may be, their continuance may so augment their intensity that they may assume the importance of verities and play the part of impressions formed by the senses.

During such a period of waiting the mind is peculiarly receptive of impressions by the senses, particularly those of sight and hearing. For the patient, this interval of waiting is a period of dread, even of terror and fear, and impressions made under such circumstances are deep and lasting. Even if the sensory stimuli be weak, they

leave their impression in subconsciousness and under favorable circumstances a revival of these ideas is possible. It should be remembered by the anesthetist that the persistency of an idea is subconsciousness, the ease with which it can be brought over the threshold of consciousness, the intensity of this idea when it is apprehended, as well as its vividness when apperceived, depend not only upon associated ideas, but also on the condition of the mind when the first impression was made and the clearness and distinctness of the integral parts of the field of apperception at the time the idea is apprehended. It is necessary only to question a person years after he has taken an anesthetic to know how accurately and vividly he can recall circumstances, particularly unpleasant ones, that attended the induction or accrued while he was waiting for the anesthetic. In many cases such impressions remain as only unpleasant remembrances, in others, the disturbance is so great as to be of pathological importance. It must be remembered that such patients seldom are seen afterwards by the surgeon or the anesthetist but the psychiatrist knows them well. At times a subconscious idea, implanted while waiting for an anesthesia assures the importance of an obsession and this may manifest itself only years after the anesthesia. Let me cite an illustrative case: A. B., male, 32 years old, liquor dealer, of robust health, mild drinker, presented himself to a psychiatrist on account of certain obsessions. They were three in number. First, a fear of going to a doctor's office. Second, fear of any sharp instrument, particularly of a knife; a fear that he might be killed by it or an idea that he must kill someone with it. Third, a fear of death. He said, "I can't reason myself out of it." These obsessions were traced back unmistakably to conditions connected with a waiting for the anesthetic at two operations. The first, fourteen years previous, for appendicitis. The patient was told the diagnosis and what would have to be done, but in order to obtain the consent of his parents, he was kept waiting in the operating room for two hours, which were to him as he expressed it "a period of great suspense and dread." The second operation, for hernia, was ten years later, that is four years previous to his application for treatment for his obsessions. His record shows that he was rushed to a hospital sixty miles distant, taken to the operating room and was kept on the operating table for some time before the anesthesia was started. The patient says, "knives were all around me. I lay there in fear of death all this time. The anesthetic didn't bother me, but *I feared death* and now when any fear or anxiety overwhelms me, I see imaginary knives and fear knives, so that even the sight of a sharp instrument makes me fear myself."

This is a very fair example of the late appearance over the threshold of consciousness of ideas stored away in subconsciousness by the improper care of a patient awaiting anesthesia. The circumstances of terror and fear, in the midst of hospital surroundings which were such as they should not have been, made possible impressions in subconsciousness which entered consciousness and occupied the focus of attention, the moment that any fear or anxiety let down the barriers of the region of the subconscious and permitted them to be apprehended and apperceived.

There is only one way to prevent such a mental condition. It is to keep from the senses of the patient to be anesthetized anything and everything that could disturb him or impress upon him undesirable ideas. He should not be removed from his bed or otherwise disturbed in his regular living until the anesthetist is actually ready for him. He should not be made to lie on a stretcher or on an operating table waiting a delayed anesthesia. In the anesthetizing room there should be no instruments or anything else to suggest operative work. All should be quiet, no slamming of doors, no passing to and fro in the room, no whispering, no talking of operations, anesthesias, or other hospital matters. Everything, even to the most trivial circumstances should make for tranquility of mind, and the leaving of pleasing impressions on the sensorium of the patient. I shall have to recur to this when I speak of the induction of anesthesia.

A third disturbing psychic factor in anesthesia is a lack of confidence in the anesthetist by the patient. If perfect trust is wanting the patient will try to control the induction, thereby disturbing it, particularly when co-ordination of the senses is wanting. This negative condition, a lack of confidence, becomes positive distrust if anything that may be interpreted as deception occurs and early in the induction the patient antagonizes

the anesthetist. To prevent distrust and establish confidence, care must be taken to tell the patient the truth about the anesthetic and this *at the proper time.*

First. The patient should not be told that he will not mind the anesthetic and that he will go right to sleep, for if he is told so there will be trouble. The odor of anesthetics is disagreeable to most people. If the patient has been told he will not mind it, when he inhales it and doesn't like it, he feels he has been deceived. Again he does not go "right to sleep," as he has been told he would, at least as he interprets "going right to sleep." The phenomenon of time is variable. The estimate of the spacing of its components and therefore of its length is not absolute. However many seconds a pendulum may tick, the estimate of time, is not made for the individual by a chronograph. Succession, as a cerebral phenomenon, determines it for him and the estimate differs from some arbitrary standard, as that of a clock, for instance, according to the action of the brain or the condition of the patient's mind. Certain drugs greatly modify it. Cannabis Indica lengthens it; pleasurable states shorten it; pain, anxiety, fear, prolong it. The patient, who is being anesthetized, and who has dreaded the anesthesia, thinks it a long time before he goes to sleep and if he has not been informed rightly, a disturbing cerebration results. He reasons thus, "I was told that I would not mind the ether, but I do; I was told that I would go right to sleep, but I don't;" and he continues, "so the surgeon said the operation would not hurt me, but now I think it will," and consequently the patient becomes restless. This train of reasoning reacts upon itself, calls up or creates other disturbing ideas that in their turn set up new cerebral functionings, all of which prolong and disturb the induction and unless the patient be kept profoundly asleep, even will embarass the anesthesia by the intermittent play of subconscious ideas.

There is only one way for the anesthetist to proceed. Let nothing be said to the patient about the anesthesia before he enters the anesthetizing room. There let all be frankness. The anesthetist now should approach the patient in a quiet, assuring but matter of fact way, and avoid giving the patient any impression that he is trying to soothe him into submission. Let him ask him, for instance, if he ever took ether before? If he answers "yes," ask him if he liked it? To this question the replies may be various. Some will say, "No, I didn't, it was fierce." Others, "No, but I had to take it and so I made the best of it." Some may say, "I didn't mind it much."

Or to the first question the answer may be negative. However, whether the reply be, "Yes" or "No," let the anesthetist say to the patient, "Well, now, listen, I have something to tell you, people who take an anesthetic don't like it. They don't like the smell of it and you won't. You may find it *very* unpleasant but if you will breathe regularly and deeply, then what is disagreeable will go away more quickly than it will if you do not breathe well." This simple, plain, frank statement will accomplish two things, it will establish in the patient directly a confidence in the anesthetist and indirectly a confidence in the surgeon. When the patient finds the odor of the anesthetic unpleasant, he realizes that the truth has been told him about it and he believes that since he has not been deceived in respect to what is disagreeable about the anesthetic, also he has not been deceived about the rest of what is to be done.

Again it will secure the assistance of the patient at a time when it is needed. He feels that the anesthetist has put upon him the responsibility of doing away with what is disagreeable. It is not by removal of the mask or by anything else that the anesthetist may do, but by his breathing regularly and deeply that the unpleasant part of the anesthesia may be shortened. And after he has taken a few deep breaths he doesn't care whether he breathes ether or perfume.

A word should be said about the use of oil of orange in connection with the induction of anesthesia by ether. There are three elements that combine to make disagreeable the inhalation of ether vapor. The first is the touch of the vapor with the faucial membranes. This unpleasant sensation may arise from the touch of any gas, even an inert one. I call this *"the tactual element."* The second is the direct irritation of the mucous membrane by the ether vapor. I call this *"the physico-chemical element."* The third is aesthetic in character. It is merely a question of personal like or dislike of the odor of ether vapor. To

some persons the odor of ethyl ether is pleasant, to most persons, however, it is unpleasant. For the majority of those who have been put to sleep by it, it is repulsive especially if harsh methods of anesthetizing were used. In many such persons this feeling of dislike is a complex one, due mostly or even wholly to association ideas. The impressions received at a time of anxiety and dread, and a faulty administration, become associated with the persistent odor of the ether and all is fused into a complex feeling of disgust which is called forth whenever any of the original elements, particularly the odor of ether, impress the sensorium. This I call *"the aesthetic element."* The value of the oil or so-called "essence" of orange is wholly confined to a masking of this odor of ether. It is able to do so if concentrated and used properly, for the odor of the terpeneless oil of orange is considerably stronger than the odor of ether vapor; how much so it is difficult to determine. The sensations of sight, hearing and some others increase in proportion to the logarithm of the stimulus, but the relative increase in the sense of smell cannot be determined so accurately. I myself am unwilling to allow anything of even so large a range as twenty times as strong as the odor of ether for the odor of the oil of orange. The ponderous nature of the odoriferous emanations of oil of orange and the extremely rapid volatility of ether when absolute, together with the rapidity with which it obtunds the olfactory nerve, must necessarily give too high figures for the oil of orange and too low figures for ethyl ether. There is some difference, however, in favor of the oil of orange.

To use it for masking the odor of ether about two minims of the terpeneless oil of orange or its equivalent of alcoholic extract, should be placed in the inhaler near to the nostrils, but not too near, else a preponderance of the odor of the oil will be had and this itself is irritating to some noses. If the proper amount is used, and correctly placed in the inhaler, the odor of the ether vapor may be so masked that it will not be repugnant to certain patients. There are those who prefer the odor of the ether to the combined odor.

I have been asked: "Would I never control the patient's mind by drugs?" In reply, I say I wish no morphin preliminary to the anesthesia except in three classes of cases. My reasons are these:

1. Patients differ so in their idiosyncrasy to morphin that a correct dose is difficult to determine.

2. It does away with the anesthetist's two most important waymarks. These are the character of the respiration, which varies with the operative procedure, and the light reflexes of the pupils.

3. Unless administered in undue quantity, morphin prolongs the induction and necessitates more ether to be used, since it diminishes both the number of respirations per minute and the amount of tidal air at each respiration.

4. Morphin prevents the patient clearing the larynx if necessary. Should any liquid or solid substance find its way into the larynx during anesthesia, the patient without an opiate can usually be made to cough it up. This is effected by a removal of the anesthetic, allowing a recovery until the vomiting center is reached, then if the patient does not expel it without assistance, tickling the back of the throat and it will be coughed up.

So especially in adenoid and tonsil cases, if morphin be given preliminary to the anesthesia trouble may arise not only during the operation, for the reasons just mentioned, but after the patient has been put to bed, blood, oozing from the nose or throat, will find its way into the larynx and trachea because the patient cannot clear the pharynx.

5. Morphin favors sudden respiratory arrest with a slow, intermittent respiration after it has been restored. This occurs upon sudden stimulation of the solar plexus or hyperstimulation of the sympathetic ganglia which lie on the anterior surface of the sacrum.

6. Morphin favors post-operative nausea and vomiting.

7. Morphin may allow asphyxia during recovery. Should the patient vomit and because of the opiate an inability to completely expel it exist, some may be aspirated into the lungs with serious results.

These are some of my reasons for not using morphin. The three classes of case in which I demand its use are these:

1. Nervous cases with marked physical manifestations. In these, the mental disturbance may precede and cause the physical. Such a case would be an accident emergency. The trauma de-

manding surgical interference may be slight, but the mental shock from circumstances attending the accident may be great and as a consequence the patient has marked respiratory and cardiac disturbances. Or the physical condition may precede and be the cause of the mental disutrbance. Such a condition exists in the patient with an ordinary exophthalmic goitre. Many such patients have died while being wheeled from their bed to the anesthetizing room because of the combined fear and nervous bodily state, so I wish such patients to have sufficient morphin before the anesthesia to cause them to go to the anesthetizing room with a tranquil mind.

2. The second class is that of pronounced alcoholics. The disturbance on the table caused by these patients is not an exciting power of ether, but the peculiar cerebration which dominates the alcoholic whenever he is out of a restraining contact with his environment. We see it manifest as he sits in the car without newspaper or companion, in the restaurant if he is alone at the table, when he is in bed about to go to sleep, as well as partially under an anesthetic. It is a peculiar exciting cerebration. Opium prevents this brain activity, so I wish the alcoholic to have morphin to reduce him to a normal subject.

3. The third class is that of young or middle-aged men of a marked athletic type or build. Such, as a rule, secrete a tenacious mucus which forms diaphragms in the smaller tubes of the lungs and prevents an interchange of both ether vapor and air between the lungs and the blood. As a result there is marked cyanosis and the induction is very tedious and difficult. Small doses of atropin will prevent this. But atropin alone, in these cases, will so intensify an already powerful action of the abdominal muscles, and so increase the extent of the excursions of the abdominal walls, that should the parietes be involved in the operation, the ease or success of the surgeon's work will be interfered with. Therefore, for these cases I demand a little morphin, not for purposes of anesthesia, but to counteract any hindrances for the surgeon that the atropin may set up. With these three classes of cases my use of morphin begins and ends. I am sorry to have to use it in these, but of two evils I choose the lesser.

Turning now to the patient as he lies upon the table in the anesthetizing room, it is necessary for the anesthetist to remember that he must deal with the patient's mind as it is. What the anesthetist has to do is to keep below the threshold of consciousness any undesirable elements and to control and guide those that constitute the field of consciousness. He should remember that it is useless to appeal to the patient's will. Frequently the anesthetist explains to the patient what the anesthesia may be like and requests the patient to behave thus and so. Such is of no use. At the time the appeal to the patient is made he understands and intends to obey, but at the time when the assistance could be of help the patient has no will.

The most highly differentiated cells of the central nervous system are affected first by the anesthetic. Of psychic states, the higher the order the earlier are they disturbed or extinguished. Therefore, we find the will crippled first. Very early in the induction it becomes weak and it continues to get weaker until soon it not only is unable to direct and control the movements of consciousness, but also cannot resist the disturbing play of associations and the inroads of ideas from subconsciousness. These psychic states consequently assume undue importance; associations and ideas, whose power to impress a weakened sensorium increases as the volitional control diminishes. The anesthetist must appreciate this condition. If he does he will not rely on any help from the patient and will gain control of the patient's mind before its wild play has caused trouble. This may be stated a little differently for emphasis, because of its importance. At the time when the patient's assistance is needed apperception is not possible except in a very special and limited way. The patient has practically no power of attention, none except as created by something that someone says or does, for it is possible to call forth by suggestion for a short time an effort on the part of the patient which may be called momentary or transitory apperception. It has the characteristics of attention because the psychic state has a focus more or less sharp, but it is only for a moment. Therefore, in this respect it differs from normal attention or act of apperception. This lack of persistency, except as continuance is maintained by external

means, is the important point for the anesthetist to bear in mind.

Therefore, there should be no disturbance present to influence the patient's mind and the necessary control during the induction of anesthesia should be by the anesthetist alone, and it is well for him in assuming this command to know how this realm which, for the time being, he has to govern, differs from a normal mind.

Consciousness is not lost, but disintegrated. The elements of the field of consciousness, as well as those of the field of apperception, no longer work together harmoniously. Unified apprehension and apperception which constitutes the ego what it is do not exist. Therefore, the "I," the personality, is non-existent. Emphasis should be laid on this word *"unified."* There is still apprehension and also a sort of apperception during the beginning of the induction of anesthesia, as has been shown. The field of consciousness is narproceeds. As the field of consciousness narrows, rowed and continues to narrow as the induction subconsciousness, which is always responsive to association processes, assumes a more and more important activity and pours its ideas in increasing numbers over the threshold into consciousness which now consists of units uncontrolled by any true apperception and, therefore, are ready to follow any line of association that may be suggested. At this time psychic complications or associations of disparate senses may play not only *an* but *the* important part in the association train. Such associations of disparate senses are more or less common in normal waking existence, but they are commoner during the induction of anesthesia, especially that of chloroform, since then marked hyperesthesia of the senses of hearing and of touch exist. But the difference for the anesthetist to remember is that in waking life they are under control, while during the induction of anesthesia they are not.

A patient at such a time is more like a man in that stage of sleep when dreams are possible, but differs from the dreaming sleeper in that the state of the partially anesthetized patient is more fixed. The complication cannot completely arouse him. To illustrate what I mean, let us recall some everyday experiences. The sound of an explosion is heard. What caused it is not known, but a weak visual image of flying rocks or of a shattered building and scattered debris accompanies the sound according as the hearer has had some experience with the blasting of rock or a powder mill explosion.

A band is heard in the street. Whether it advertises some circus or precedes soldiers marching is not known, but a weak visual image of a college commencement procession, headed with its band, or the passing of troops is had, according as the one or the other has been an object of marked attention in the past.

We see a violin and are conscious of a weak auditory sensation of its clang. We see some favorite fruit, either natural in a store, or artificial in a museum, and we say our mouth waters, that is, a momentary sensation of the taste or flavor of that fruit is experienced when it is seen. In these instances the disparate senses of sight and of hearing or of sight and of taste have been associated. So a stimulation of any one sense may arouse associated ideas, not only of that sense but of any other of the senses. These disparate sensations or complications may be and are usually very weak in ordinary life. It is not, however, their intensity for the waking subject that is of importance to the anesthetist. It is their existence at all, and especialy the fact of their necessary existence. If this is borne in mind, the anesthetist will understand not only how psychic complications can and do arise, but he will expect them and anticipate their coming. He will know that in the patient's going to sleep by the anesthetic a disturbance of one sense may arouse a disturbing train of ideas in that or in any other sense, and that not only the sense aroused primarily, but that activated secondarily may in turn set in operation association trains of ideas which, once started, may become intensified almost indefinitely according to the law of cumulative psychic action. In other words, if during the induction of anesthesia association processes are allowed to get to work, inasmuch as co-ordination is lost, subconsciousness, which assumes an importance inversely as the activity of apperception at the time being, may send over into consciousness ideas of such a kind or in such numbers that dissociative activity may generate from them trains of mental experience, the wildest and most exciting of which the human mind is capable. If the patient should translate any of this psychic

activity into bodily action, as he could and often does do, a so-called secondary stage will result and the anesthetist will have a fighting patient very difficult to subdue.

On the other hand, if all disturbing influences are kept from the patient, and if by any means apperception is kept directed to one idea, all other apprehended units will disappear and the field of apprehension will become narrowed down and finally limited to the field of apperception. Thus the patient will be kept under control until the anesthetic has eliminated all possibility of sense impressions and also subdued the motor centers.

The anesthetist then should talk to his patient during the induction. Never for a moment should he allow the patient's mind to run its own course, for he cannot tell when some vivid idea may arise and upset an otherwise smooth anesthesia. In talking with the patient he should never ask a question or suggest any unpleasant idea. If a question is asked, the patient may answer, but since coordination is lost very early, the speech center is likely to continue its activity and a coherent reply will pass into incoherent talking and then into an inarticulate jabber, which will continue until the center yields to the anesthetic. This, however, is not likely to be soon, since during the activity of the speech center the patient does not breathe deeply or otherwise well, and consequently the induction is prolonged and disturbed.

What then shall the anesthetist say to the patient? If he analyze the content of the patient's mind he will find the answer to this quesion. There are two ideas prominent in the mind of every patient who comes up for anesthesia. One is that *something may go wrong;* the other *that he may be cut before he is analgesic.* The first idea is a peculiarly oppresive one. The mind that could bravely encounter danger, were the danger visible, becomes fearful and weak if the danger be hidden and particularly if there is a question whether it does or does not exist. Therefore, the patient who as a rule dreads the anesthesia more than he does the operation is in a distressing state of mind, which is not conducive to a good anesthesia.

In talking to his patient the anesthetist should confine his statements to what the patient needs to know, namely, tell him that "everything is all right." The same words need not be used constantly, but the phraseology may be varied according to the command the anesthetist has over the language the patient understands. However, even this idea must be expressed in sentences comparable with the patient's scope of attention. While for the normal mind the scope of consciousness varies with the way objects are grouped or the rhythm read into successive sounds, the scope of attention is pretty constant, reaching a maximum in six isolated sensations, as six letters or dots for sight, or six beats or syllables for hearing. Now further, for the patient who is passing under the influence of an anesthetic, the number of isolated elements that can stand in the focus of attention contantly diminishes until it becomes zero. This means that the anesthetist in talking to his patient at the beginning of the induction should limit his sentence to six syllables clearly enunciated, and as the induction proceeds should shorten his sentences or phrases to five, four, three and two syllables, and end with only one. Such a series would be:

6. You are do-ing all right.
5. Every-thing is all right.
4. You are all right.
3. All is well.
2. All fine.
1. Fine.

It is best to have important parts of several successive sentences identical. This assists the attention of the patient and emphasizes the salient idea.

By thus talking to the patient, the anesthetist not only keeps the patient's mind under control, preventing inroads of ideas from subconsciousness, but he gives the patient the assurance he needs and prevents his fears disturbing the anesthesia.

The anesthetist hardly needs to be reminded that the syllables should be spoken in a somewhat loud tone and be clearly enunciated. It is essential that the patient understand what is said when his mind is confused by the anesthetic. As the scope of apperception diminishes, the field of consciousness disintegrates and the boundary between it and subconsciousness becomes less definite. Subconscious ideas, then, are more easily apprehended. The anesthetist will understand that by continually reminding the patient that "everything is all right" he cre-

ates for the moment a focus of attention, a field of apperception, which as we have seen is, under the circumstances, practically coextensive with the greatly narrowed field of consciousness. So in thus creating a field of consciousness of such a nature, he for the time being erects a barrier at the threshold of consciousness and excludes subconscious ideas.

Keeping in mind, therefore, this fact of the existence of a continuous series of momentary fields of apperception which continually narrow as the induction proceeds, the anesthetist will understand further why he must lessen the number of syllables in his sentence pronounced to the patient as the induction goes on, and still again why he should take care that emphasis be upon the word representing the salient idea which he wishes to impress on the patient's mind. Hence, at first "everything" and "right" should be emphasized and later "right," "fine," "well."

The second dominant idea in the mind of the patient is that he may be cut before he is analgesic. To care for this mental state, negative treatment is the best. This consists in an endeavor not to permit the idea to be converted from an apprehended idea into an apperceived idea, or if it has sunk into subconsciousness, to prevent its being aroused and entering the field of consciousness. To accomplish this, *let the patient absolutely alone during the induction.* Do not touch him or allow him to be touched for any purpose whatever, except some extraordinary occurrence render it imperative. Also he should not be strapped on the table, and no straps or other possible means of restraint should be visible. There should not be any orderlies or nurses around whose presence could suggest restraint. The patient should be allowed to assume for himself the position which is most comfortable for him, except, of course, if he desires to go to extremes and get into a side or a prone position. This I have never seen a patient do. The only exception to this concerns the head, which, whether comfortable or not, should always be in a position from the beginning of the induction to allow a free airway.

Again, on account of its importance, let me say that by leaving the patient alone is meant not touching him for any purpose. No nurse, clergyman or friend should be allowed to hold or touch his hand. If sheets or other things about the table are not strictly in accord with the hospital regulations, let them be just as they are. If the surgeon is in a hurry, let the patient alone. Do not attempt to save time by getting the patient "into position" until full surgical anesthesia has been induced. To do so will be to lose time. The only exception to this is that the patient may be scrubbed up while the induction is going on, providing it has been begun and is well under way before any of the anesthetic has been administered. In such a case, tell the patient he is to be washed up and that while the scrubbing is going on you will give him the anesthetic. Then do not begin the administration until the preparation is well under way. Thus the patient when he is partially anesthetized will not misinterpret what the nurse or orderly is doing to him. The scrubbing up will at first be an object of apperception and throughout will remain at least an apprehended idea. Why is this to be done? Because if the patient is touched during the induction, inasmuch as coordination, a regulating contact with environment, is lost, he will interpret a touch of any kind as the beginning of the operation and he will let the aesthetist know that he is still conscious. This he will do by some motion of limbs or head. To his abnormal mental activity, which his surroundings cannot check up, his movements seem small, but as a matter of fact he is thrashing around on the table and restraint may be but is not always necessary. If now he is held he will interpret the restraint as for the operation and the anesthetist will have a fighting patient. Most of the so-called "secondary stage" is due to the patient trying to let the anesthetist know that he is not ready to be cut.

The patient may not lie perfectly quiet on the table. He may move an arm or a leg as he would were he going to sleep naturally. This is of little consequence and need not receive attention unless a leg falls off the table, when it must be replaced. Very gentle handling must be had, however. If an arm or a hand is held up and it is likely to fall on the inhaler or the field of operation, it must be guided to the place where it should lie. To do this the anesthetist or any

one else should never take hold of it. Such an attempt will be misinterpreted and give trouble. Let the anesthetist or his assistant place his own hand where the patient's hand will fall on it and when it has fallen, by a slow, gentle movement guide it to where it should be. The patient distinguishes between the anesthetist touching his hand and he touching the hand of the anesthetist. The former he will misinterpret and respond to; the latter he will understand and will remain passive.

Two more psychical phenomena are of importance in anesthesia. One of these is that an involuntary blindfolding, coupled with fear, causes a feeling of impending suffocation. This is true in the psychological laboratory as well as in the anesthetizing room. It is not a sense of suffocation that results, but a feeling of *impending* suffocation.

The patient just before or at the commencement of anesthesia, does not complain of being choked, if minimum quantities of the anesthetic are administered, but he says: "Doctor, don't choke me," "Doctor, you'll smother me." It is something he feels is *about* to come—not a sensation that is present. If this idea is allowed to form, or to persist if formed, the patient will grab the inhaler or struggle to get away from the anesthetist, and as the anesthetic takes a firmer hold on him complications will arise, and to what extent these associations may go the anesthetist cannot tell.

The patient's eyes then should be left uncovered during the induction. He should be allowed to use them just as he pleases. Since I made my inhaler so that it cannot cover the patient's eyes I have never had a patient complain of impending suffocation.

The last psychic condition to which I ask attention is the horror people have of taking an anesthetic the second time. This is because of the unpleasant concomitants of the former anesthesia. Of course, the way to prevent this postanesthetic antipathy is to have the induction of the anesthesia free from all unpleasantness. The phenomena preceding and incident to induction of anesthesia remain prominent in the minds of patients for years, even when all else connected with the operation has passed out of the mind.

The reason is multiple. First, there is a feeling of dread—dread of the anesthesia, dread of the operation. Then there is the feeling of fear —fear that something may go wrong, fear that the findings of the operation may be unfavorable. Then there is the feeling of complete helplessness. The patient feels he must give himself into the hands of strangers who can do with him as they please; that he himself will have no control over the situation. Then there is that feeling which of all is to many patients the worst, namely, the feeling of voluntarily closing their eyes on the world with the possibility of never opening them here again. All of these ideas make the mind peculiarly sensitive and the most insignificant impression at this time is a lasting one.

Therefore, every effort should be made to render the induction as free from unpleasant circumstances as possible. I have already explained the rationale of success in accomplishing this so far as psychic methods obtain. The only additional point that it is necessary to make refers to part of the actual administration of the anesthetic, the full details of which lie outside the province of this paper. This point, necessary here, is that at first the anesthetic should be administered very slowly. The induction should be gradual. If the anesthetic is ether, there should be no limitation of respiratory air and the ether should be dropped onto the mask very slowly. By doing this the membranes of the respiratory tract will become locally anesthetized so that later the ether may be dropped rapidly for a speedy induction without any irritation from the ether. If this and the other methods of procedure which I have explained are carried out, few patients will shrink from a later necessary anesthesia.

A CASE OF TUMOR OF THE HYPOPHYSIS WITH OPERATION.*

EMORY HILL, M. D.,
CHICAGO.

H. C. N., male, American, aged 41, was referred to me on April 7, 1913, by his family physician for advice in regard to operation for a supposed brain tumor.

*Read at the sixty-fourth annual meeting of the Illinois State Medical Society at Decatur May 20, 1914.

The patient had typhoid fever some years ago, but has been well otherwise, as are his wife and one child, a boy of 16. There is no personal or family history of importance.

The present trouble dates from September, 1911, when he was awakened in the mornings by frontal headache and nausea. He noticed that he was practically blind in the temporal field of the left eye. Thinking that excessive use of tobacco might be injuring his eyes, he ceased smoking and his headache soon stopped. He consulted Dr. William E. Gamble of Chicago, who kindly furnished me his notes, recording symptoms of excessive intracranial pressure at that time, with defective temporal fields, more involved in the left than in the right eye. Vision was Rt. 20/200, Lt. 4/200. Within the next four months, under Dr. Gamble's care, improvement occurred until the vision was Rt. 20/25, Lt. 20/50, with correction for a slight degree of compound hyperopic astigmatism. Dr. Gamble now observed (January, 1912) left temporal hemianopsia and concentric contraction of the right field, the limits being 80° temporal, 50° above, 55° nasal, and 50° below.

In June, 1912, the patient consulted Dr. Casey Wood of Chicago, to whom I am indebted for the following observations: Vision Rt. 20/70, Lt. 20/100, indicating a failure of central vision during the preceding six months. Improvement followed the use of strychnia and electricity, until in September, 1912, vision was Rt. 20/40—, Lt. 20/70—. The fields charted by Dr. Wood show little change in the left eye. The small area in the upper temporal field preserved in June, 1912, was lost so that fields taken in August and October reveal a sharp vertical line through fixation. The color fields were markedly contracted. The right fields show temporal narrowing of the form field, temporal hemianopsia for colors, and a large paracentral scotoma. The chart made in October indicates some widening of the form field and diminution of the scotoma, as compared to the findings in June. The color fields on the nasal side are much contracted.

During all this period the patient was free from discomfort except for his visual limitations. There was no recurrence of the evidences of increased intracranial pressure from which he suffered for one month at the onset in the autumn of 1911.

My examination (April 7, 1913) revealed vision Rt. 20/50, Lt. 20/70, not materially improved by his old correction. Externally the eyes were normal except for the pupils. The right pupil was 2.5 mm. wide in ordinary daylight and did not react to light and very slightly to accommodation. The left pupil was 2 mm. and reacted normally to both light and accommodation. Wernicke's hemianopic pupillary reflex was absent.

Intraocular: The lenses were noticeably sclerosed for a man of 41; the vitreous clear; the discs distinctly gray, edges fairly well defined, but giving the appearance of secondary atrophy following a very mild degree of optic neuritis. There was a gradual slope from the temporal borders to the base of the shallow physiological cups. Some pigment disturbance was noted about the discs, giving a moth-eaten appearance. A few fine, faint glistening spots were seen at the maculæ. The arteries were much contracted and the veins full and pulsating. The difference in the caliber of the two sets of vessels was more pronounced in the left eye.

The refraction proved to be quite different from that found in 1911, owing, no doubt, to changes in the crystalline lenses:

Under hematropin: Rt., -1.00 sph. $+$ 1.75 cyl. $\times$ 95° $=$ 20/30— last two letters. Lt., -1.00 sph. $+2.00$ cyl. $\times$ 100$=$20/40—first two letters.

Postcyclopegic, he accepted the same correction with vision Rt. 20/30 $+$ 2, Lt. 20/40 $+$ 2. Muscle test for far, exophoria, 1½°, right hyperphoria, 1½°. Thus central vision was seen to be practically as good as at any time recorded since he first consulted Dr. Gamble nineteen months before. The fields revealed interesting alterations since Dr. Wood's last record six months previously. In the left there was a slight encroachment upon the nasal field above and below. In the right the form field had receded until there was only a narrow strip remaining above in the temporal half, while in the nasal half the form field was intact and colors moderately contracted. Thus we find very little change in the fields of the left eye in a period of fifteen months, while there has been a marked increase in the limitation of the fields of the right eye in six months. However, it must be noted that the patient, who is a very intelligent man and a careful observer of his symptoms, was positive that the failure in the right eye had occurred shortly after the records made by Dr. Wood in October, 1912, and that no change had taken place within the five months preceding my examination in April, 1913.

The x-ray picture was suggestive of enlargement of the sella turcica, but was not considered conclusive. Dr. Archibald Church of Chi-

cago had examined the patient from the neurologic standpoint and had found nothing beyond the facts already stated. There was a noteworthy lack of evidence of neurologic disorder and of ductless gland disturbance. Dr. Church concurred in the opinion that operation should not be undertaken at this time, in view of the absence of symptoms save in the eyes and the great probability that the process had been at a standstill for a year in the case of the left eye and five months in the case of the right eye. The patient was advised of the seriousness of his condition and urged to remain under observation in order that he might have the benefit of prompt operative interference in the event of any further failure of central vision or encroachment upon the visual fields.

On May 20, 1913, vision was Rt. 20/30 + 1, Lt. 20/40 + 1. The fields showed no material change; there was a trifling increase in the extent of the form fields. The patient was comfortable and continued to attend to his business.

On June 23 he returned with the statement that he had vomited several times and had a sense of weakness in the legs and was very drowsy. Vision of each eye was 20/40. The fields showed some further limitation. The patient was apathetic, with difficulty fixed his attention, and dropped to sleep several times while in the office. I now advised operation, in view of the further involvment of the eyes and the recurrence of symptoms of intracranial pressure. Unfortunately he was delayed by business affairs and several months elapsed. I saw him again on September 23. He had then had more vomiting spells. Vision was Rt. 20/40 + 1, Lt. 20/50 + 2. Now the form fields were more narrowed on the nasal side. He was urged not to delay operation.

In October he went to Boston to consult Dr. Harvey Cushing. On October 4 Dr. Cushing operated by the transphenoidal route, as described in his book, with a mid-line approach under the upper lip. Dr. Cushing has kindly furnished me a description of the operation, from which I quote: "On exposing the sphenoidal cells the anterior wall came away in one large piece, as it had evidently been very much thinned, and the sphenoidal cells themselves were full of the strumous tissue. When this was scooped away the protruding base of the capsule of the gland was exposed, but all the bony sellar floor had been absorbed. There was one spontaneous perforation in the distended capsule, through which the growth had undoubtedly extended into the sphenoidal cells. Thus dural capsule was split and a large amount of the contents (possibly one-half) scooped away. The mucous membrane was allowed to come together and the wound in the lip closed with a stitch or two. The tissues are very suggestive of a malignant transformation of the struma, and I very much fear that there has been an intracranial extension as well as this extension into the sphenoidal cells. It is probably for this reason that there was very little improvement in the outlines of the perimetric fields."

Following the operation the patient remained comfortable and until now has had no recurrence of symptoms. I examined him on April 29 of this year and found him apparently well except for a tendency to grow tired and to yawn after the attention necessary in having his visual fields charted. He has been taking Armour's pituitary extract, ten grains of the dried extract three times daily. He says that he feels as well as ever, except for growing sleepy. He formerly led an active life, but gave up his business last autumn and is idle much of the time now.

Examination reveals the right pupil 3.5 mm. in width, with no reaction to light direct or consensual and very faint reaction to accommodation. The left pupil is 2.5 mm. and does not react to direct light. It reacts very faintly when light is thrown into the right pupil and very faintly to accommodation. The fundi show the same appearance as in April, 1913, except that there is not quite so much difference in the caliber of arteries and veins. With the old correction vision is Rt. 20/30 + 1, Lt. 20/40+1. A slight change in his lenses gives better vision: Rt.—1.50 sph. + 2.00 cyl. × 100° = 20/25—2. Lt. — 1.50 sph. + 2.00 cyl. × 105°=20/30 + 2

This is the best vision recorded at any time since the onset of his trouble. There has been a slight widening of the form fields and a distinct improvement in the blue fields since operation.

Dr. Cushing is not hopeful of a permanent result, because of the likelihood of malignancy and

the failure of rapid improvement in the fields after operation.

Several interesting features present themselves in a study of this case- Such extensive involvement of the pituitary body and its surroundings generally causes profound neurologic disturbances and changes in bony structure and the sexual functions, all of which are wanting in this case. There are no acromegalic changes, no adiposity, no alteration in the patient's sexual life. It is to be regretted that opportunity was lacking to make prolonged temperature records and study of the carbohydrate tolerance. The symptoms of excessive intracranial pressure were present for only a few weeks at the onset and were absent for a year and a half, when they recurred with greater severity. This may perhaps be explained by the supposition that the growth quickly penetrated the very thin sellar floor and had room to grow in the sphenoidal cells. The freedom from pressure symptoms was coincident with the rupture into the sphenoidal cavity and was maintained until this cavity was filled by the tumor mass, when pressure symptoms again occurred.

The result, as far as vision is concerned, is very satisfactory at present. A bitemporal hemianopsia remains, but surprisingly good central vision. The ultimate outcome is decidedly doubtful. Further operation may be necessary and its effect is by no means certain. Dr. Cushing tells me that he has had some success from radium, the tube being inserted into the cavity after the operation.

People's Gas Building.

DISCUSSION.

Dr. J. Holinger, Chicago: It was my privilege to make hearing tests in four cases of tumors of the hypophysis, and in every one the tuning-fork tests were characteristic, in that the hearing by bone conduction was very much shorter than in the normal. In different affections of the brain and skull, recent and old fractures of the base of the skull, tumors, internal hydrocephalus, etc., the short Weber-Schwabach in the better ear was universal. You will agree that an early diagnosis in these cases is as important as anything in our dealing with the subject, and if this test can help to make a diagnosis earlier than many others, I think it ought not be forgottten in any case that is suspicious of brain tumor.

Dr. Emory Hill, Chicago: I agree with Dr. Holinger that the hearing test is an important procedure in determining the diagnosis. One excuse for reporting a single case of this sort is the observation that eye men are not making very frequent diagnoses of this kind. They are not making early diagnoses. I was astonished in studying the literature of hypophysis symptoms from the standpoint of the eye to discover the great number of symptoms that may be found. We have a tradition that bitemporal hemianopsia means lesion at the chiasm, which is true; but that is a late manifestation. We do not always see the case in that stage. We do not get it in both eyes very often, and there are premonitory symptoms long before that; slight visual field defects on the temporal side which are not hemianopsia, scotoma, central or perhaps elsewhere in the temporal field, narrowing of the temporal field for colors more rapidly than for form. All these things, together with ocular muscle palsies, show the involvement of the pituitary body and with exophthalmos and pupillary inequalities and optic nerve changes are the points on which it is often possible to make a clear diagnosis of hypophyseal lesions; and in a great majority of cases it is distinctly up to the eye man to make these observations, because, as in this case, other than eye symptoms may be lacking and no one else will advise operation.

THE PROBLEM OF THE STAMMERING CHILD.*

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The problem of caring for the stammering child is rendered more difficult by reason of the lack of interest in the subject on the part of physicians. Scattered here and there through the cities and towns and country the problem arises, and especially in the smaller communities no one is at hand excepting the physician who may be appealed to by the parents for advice. If the physician fails, the parents are too often at the mercy of the often unscrupulous or ignorant advertiser. In certain European countries the medical profession is much more conversant with this and allied subjects. Only recently in America and as yet in but two or three medical schools has the subject of defects of speech begun to be taught as a regular part of the undergraduate instruction. Nevertheless the subject properly belongs with the physician, and no adequate machinery exists or is likely to exist, especially in the smaller communities, by which parents may be advised concerning de-

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fects of speech in their children excepting through the medical profession. Consequently it seemed to me that one would be doing a needed service in attempting to present the problem of the stammering child with the point of view of the general physician in mind.

Seriousness. The seriousness of stammering is worth considering carefully. A disease or injury or deformity which interferes with the child's walking and threatens to produce permanent limping is considered a serious matter, but a disorder which interferes with the child's talking and thinking and social progress is deemed of little consequence. And yet, facility in talking is of greater importance to the man or woman than facility in walking. One who has come in contact with the various grades of difficulty experienced by stammerers in talking, from those who exhibit the slightest hesitation to those who can scarcely utter a word, will not doubt the sincerity of this comparison. Again, from the standpoint of the subjective mental disturbances produced by lameness and those due to stammering (not here considering physical pain), the stammerer has much the worse of it, for his mental sufferings are severe and often extreme. By no means the least serious effect of stammering is to be found in its subtle effect on character. But few stammerers develop that easy, natural, unabashed attitude towards people so important to comfort and success in the affairs of life, but more often they develop a habit of retirement, of timidity, not uncommonly morbid, and resulting in voluntary social isolation. From the standpoint of social and business advancement, the stammerer is too often in a pitiable situation. His timidity interferes with reasonable aggressiveness and the stammering excludes him almost inevitably from making the advances in the world he would otherwise be entitled to make. One does not wonder that stammerers now and then elect to take their own lives, rather than continue their discouragement and sufferings.

The Nature of Stammering. The understanding of stammering is dependent on the understanding of child psychology. But child psychology is exceedingly difficult of understanding. It is probable that the onset occurs ordinarily only after a certain stage in the mental development, which causes the child to become socially emotional, that is, emotionally disturbed by the mere social contact with others in the same manner as occurs with adults. For every human being has a social fear of every other human being, though in degrees varying with the individual and with the circumstances. In view of the fact also that stammering practically always starts before the speech has fully developed into its permanent, settled form, it may safely be said that the cause of stammering lies in the interrelationship between the still developing function of speech and the immature emotional disturbances arising from social intercourse. It is due then to the immaturity of a normal emotional manifestation reacting upon the immature function of speech at the time in activity. I am aware that such an explanation of the cause of stammering leaves very much unsaid. For it is true that in a varying degree both of these conditions hold for all children. What other more obscure conditions must be operating to cause a relatively small percentage of children to stammer, while the great majority remain exempt, are very important questions, but questions so difficult of answer as to still remain not clearly solved.

The latest promulgated theory regarding the determining cause of stammering that stammering is excited because of a temporary verbal amnesia (Bluemel), like the older theories, that stammering is the result of a lack of coordination in the time of action of the vocal and articulative mechanisms of speech, or that stammering is a psycho-neurosis, or that stammering rests upon auto-suggestion, in no manner excludes the fact that "social emotion" is at any rate the fundamental exciting factor, without which the other factors would not operate.

Manner of Manifestation. Irregularity of manifestation is the inevitable characteristic of a disorder founded upon emotional disturbance. When the emotion capable of exciting the disorder is completely in abeyance, the phenomenon does not occur, and the severity of its manifestation is measured by the degree of intensity of the emotion present at any time. This explains the absence of stammering when the patient is talking or reading to himself alone, or talking to his dog or to a young child, for a

cause for "social emotion" is then absent. And it explains the fitful variableness in the intensity of the manifestations of the disorder. The practical freedom from stammering while singing is less easily explained, but probably rests on much the same ground. More than one reason operates to quiet the stammerer's fears. For example, the manner of voice production is altered in his singing from that in his talking, thus obscuring the ordinary emotional speech grooves, the vowels are prolonged, which even in ordinary conversation eases the stammering, and the lack of necessity for vowel precision in singing may play a part. (Bluemel.)

The fitful variation in the manifestation of the disorder is the source of much confusion and misunderstanding. It is reasoned, wrongly, of course, that since the disorder is in abeyance so much of the time, one may expect it to speedily disappear altogether. And sometimes it is reasoned, also wrongly, that a disorder controllable at one moment should be always controllable, and so punishment may be resorted to, which, as a rule, increases the emotion and consequently the stammering.

The onset is usually by light repetitions of the consonant beginning the word, perhaps infrequently manifested. The speech itself may or may not be rapid. The child may or may not appear to be excited. While one should bear in mind the possibility of a so-called "physiologic stammering," resulting from the failure of the speech to keep up with the mental action of an excited child, yet persistent repetition of the beginning letters of words, even though seemingly of no consequence, or hesitation in bringing out the word, calls for intelligent watching. And observation will be likely to disclose an insidious disposition for the hesitation to become more firm and more often manifested. Under certain circumstances this disturbance will be absent entirely, and it will be likely to be manifested more with certain persons and especially with strangers. Entrance upon school life will be prone to increase the manifestation, or to first cause its appearance in a normally speaking child, because of the increased emotion aroused by the added social excitements of this new phase of life. If the manifestations remain light and infrequent, with no tendency to increased severity and frequency, one may hope for spontaneous cure within a reasonable period of months or years. But the statements of the parents are not reliable as to the stationary disposition of the disorder, and the physician desirous of appeasing the anxieties of the parents is too often falsely reassuring. More often the repetitions become very gradually more firm, until they tend to be replaced by an actual momentary fixation of the speech organs. A *habit* of stammering gradually develops and the social emotion is increased by the stammering itself. In the more severe manifestations the speech is stopped by spasm in a group of muscles during a measurable period, which may extend to a quarter or half minute or longer. The patient sometimes is seen to outwardly struggle, at other times one witnesses no movement of struggle, but only waits for the word delayed by the inability of the child to go on.

Mental Condition. We may now in a measure look in on the mental status of the child who stammers. Acutely sensitive, the sensitiveness, however, often studiously concealed, the child realizing its probable inability to talk smoothly greatly exaggerating the importance of his defect, torn by the fear of lack of appreciation or of ridicule, is the suffering slave of an exaggerated emotionalism. We are dealing then, not with a subnormal child, not with a diseased child, not with an extraordinary child at all, but with a child differing from others chiefly in the intensity and painfulness of its emotional life, rendered so by a disorder threatening to continue and produce serious effects on the development of character and serious retardation of success in the adult years.

Prognosis. What is the outlook for the unfortunate sufferer? This depends upon certain factors not always easy to make out. First, the natural temperament of the child, whether naturally highly excitable, or whether naturally shy and diffident. Second, upon other psychological factors, for example, unusual auto-suggestibility, or marked inability to recall the auditory image of the vowel sound (Bluemel). Third, upon the intensity of the spasms manifested in the stammering. Fourth, upon the prominence of the habit feature, and, finally, upon the favorable or unfavorable conditions of the environment. The

difficult of recovery is by no means always measurable by the prominence of the outward evidences of stammering. Concealment of the inward struggles is common, and the factor of subjective disposition to resist the disorder is hard to gauge. One is safe only if he subjects every case to intelligent observation, letting the developments determine his attitude towards the case.

Undoubtedly one sees many more children than adults who stammer among individuals who have had no treatment for stammering. Therefore, undoubtedly gradual recovery without especial treatment is not uncommon. The most important natural therapeutic agent operating for the cure of stammering is the growing maturity of the child, tending to bring about a more natural adjustment to his social environment. But this agent often develops late and very slowly and is much hampered so far as its effect on stammering is concerned by the element of habit involved in the disorder. Certain cases show an early disposition to lighter and less frequent spasms and eventually after a period of years recover. Others continue painfully, gaining a little on the disorder until in the mature years there is required only occasionally an inward need of struggle. The number of persons who continue visibly to stammer after, let us say, thirty-five years of age, while large in the aggregate, is relatively small in its proportion to the whole number who have stammered in childhood.

Under competent and sufficiently maintained treatment, the prognosis is altogether improved. But statistics in this connection are wholly unreliable. The difficulties of treatment are dependent upon the factors mentioned above and are dependent especially upon the factor of subjective willingness and persistence in carrying out the treatment undertaken. Practically all stammerers may be much helped and the percentage who may be cured, always providing that one can secure the right co-operation, is exceedingly high.

Is Treatment Necessary? Since recovery may occur spontaneously, it is sometimes asked whether especial treatment needs to be undertaken, excepting as a last resort. Consider that post mortem statistics show that pulmonary tuberculosis has been present at some period in the life of many persons and has healed without especial treatment. Or serious adenoid enlargements commonly disappear without operation. As no one can say which patient shall certainly recover from tuberculosis without treatment or how serious the unhindered continuance of the disease may be upon the constitutional vigor of the patient, or, in the case of adenoids, which cases shall not have chronic nose and throat disease resulting from the adenoids, or which shall not be deaf, or which shall not develop imperfect alveolar arches, so with the stammerer no one can say which case shall recover and which shall not, or how long the spontaneous recovery shall take, or how serious the intermediate results shall be upon the development of character, upon intellectual and social progress, or upon business success. The safer plan is to consider each case as containing within itself serious possibilities and refuse to run unnecessary risk.

Treatment; General Principles. When it is realized that stammering is not a disease, but is a perversion of a complicated function arising from emotional disturbance, one is in a position to understand that treatment must be applied from within by the stammerer himself rather than without by the physician. Two fundamental lines of attack are open. One, upon the conditions tending to arouse emotion, and, two, upon the perverted speech function itself. Treatment attempts, then, one the one hand, to inculcate in the sufferer such educational and suggestive ideas as shall enable him to so readjust his mental attitude with respect to the people about him that the emotion shall become reduced and more controllable, and attempts, on the other hand, to place in his possession a direct conscious command over the unruly speech function itself. Indeed, the conscious command over the speech which is given the stammering by adequate methods of training reacts towards quieting the emotion which produces the disorder. These two basal principles of treatment are in practice conjoined so as to react favorably on each other. This is not the place to go into the highly technical questions involved in the training of the speech apparatus, or into the many details of competent psychological training. I know of no problem demanding more insight into human nature, more tactful consideration of the various factors involved, more resourceful in-

genuity in meeting individual situations, or more patience and sympathy, or none where experience counts for more.

What Can the General Physician Do? Looking at the treatment aspect of the problem from the standpoint of the general physician, I presume that most general physicians will not find the time to become experts in the solving of so special a problem. But they can all be of great service to their clientele by being broadly intelligent in their advice. Too often the physician has laughed the matter off as devoid of serious importance, but such an attitude is unworthy of an intelligent profession. The physician should rather inform the parents regarding the nature of the disorder, the probable outlook, call attention to the need of guiding the child away from causes for emotional disturbance, point out the need of tactful gentleness in handling the child, encourage rest and healthful conditions of life generally. If he will study the conditions of the child's life from the physical standpoint, but especially from the emotional standpoint, he may be able to eliminate from the child's life some determining cause of emotion and thus be of very great service. Sometimes, for example, the removal of adenoids will ease the child's speech and reduce the emotion. Let the physician have the mother take the child apart and cause him to read, or to tell, a story or to converse slowly and quietly, preferably in a low voice, for a brief period each day. Let the physician have the mother try to quietly turn aside conditions which excite the child. It may be that reciting before his class in school is the greatest cause for emotion, or perhaps it is the ridicule of his playmates, or jarrings between himself and his brothers and sisters. If the progress of the stammering continues, let the physician be able to give the parents adequate advice as to what should be done further.

Time of Treatment. It is highly desirable that treatment should be undertaken as early as possible. The ideal plan would be, by taking the trouble at its very inception, to prevent the settled establishment of the disorder. No matter at what period the treatment is begun, one may expect at least a somewhat protracted struggle with the disorder. But if treatment be begun early, the severer manifestations can usually be prevented, and recovery be attained earlier in life, and with less detrimental effect upon the character of the developing child.

Institutional Treatment. There are good reasons why the child should, if home conditions are favorable, be treated without removal from his home environment. A stammerer who recovers under the identical conditions under which the development of the disorder has taken place is relatively much more secure in his new speech. Capability of control is quite another thing from cure. The attainment of control in the protected environment of an institution may be extremely easy to attain, but this is no criterion as to success in fighting the real battle which must come when life is again taken up in its ordinary activities. This explains why practically all so-called "cured" institutionally-treated stammerers relapse upon returning home. And this explains why it is necessary that every stammerer under approximately fourteen years of age who seeks treatment away from home should be accompanied by an adult member of the family, who shall become with the sufferer a student of the plan of treatment and shall use her knowledge in guiding him upon their return home. Self-control must go on until the tendency to stammer is overcome, whether this requires months or years. And it is highly desirable, and sometimes necessary, that a guiding oversight should be exercised by the speech physician during the whole period, very much as the physician guides the patient through a prolonged disease. If the stammerer seeks treatment away from home, the period of treatment should be determined by the conditions in each case, but it always must be considered that this period of treatment, so far from being final, is only the outlining of a period of careful self-control which shall end only with the disappearance of the tendency to stammer.

Pitfalls. It is now only necessary to point out certain pitfalls which are planted for the unwary. I know of no disorder in which conscientious sincerity, both as to knowledge and to the practical application of that knowledge, is more important to success in treatment. And I know of no disorder which lends itself more readily to the exaggerated and ignorant claims of insincere commercialism. Beware of the advertiser who "guarantees" a "cure" in a few lessons or in a

few weeks. To sincerely guarantee cure is absolutely impossible, because cure depends primarily upon adequate cooperation on the part of the stammerer, and this no one can measure beforehand. The value of the "guarantee" is to be gauged only by the knowledge and sincerity of the guarantor, who is only too likely to be well loaded with subtle explanations and excuses which develop later and show the "guarantee" to be utterly devoid of sincerity. Beware of the advertiser who promises to "cure" in a few lessons or a few weeks. The very nature of the disorder, its dependence upon emotional disturbance, as well as the element of habit involved, makes it clear that the disorder can be eliminated only by patient, day by day exercise of educated self-control. Usually not a few weeks, but rather months and sometimes years, are required for the complete suppression of the disorder. I doubt whether a stammerer, excepting perhaps one who happened to be on the point of spontaneous recovery, ever was cured in a few weeks. Be wary also of the advertiser who makes an extraordinary showing of testimonials. Testimonials may be honest or dishonest. If through advertising a following becomes quite large, it is not difficult to obtain a certain number of even honest (though sometimes misguided) testimonials. And then there remains, as with the patent medicine advertiser, only the adroit employment of such testimonials in advertising so as to make it appear that practically all patients fare equally well with those testifying. And this misrepresentation is possible, even though only an occasional patient does really recover. Moreover, the value of the advertiser's cure of himself as an indication of his capability in treating others for stammering (and this factor is prominent in the claims of certain institutions) may be rightly estimated when we realize the numbers who have under the influence of advancing years spontaneously recovered without any especial method of treatment. Finally, beware of the institution which attempts to pledge its patrons to the maintenance of secrecy concerning the methods employed. Such institutions not only have no method of treatment worthy of concealment, but such a plan savors too much of pretense and sordid commercialism to be dependable. But I, by no means, wish these remarks to condemn all institutions or all individuals who advertise themselves as treating stammering, but only to point out that far from all of them are worthy of confidence. To have failed to recover after treatment is not without its serious effect on the child. Such patients are prone to be more depressed, more pessimistic regarding recovery, and harder to manage in subsequent efforts at treatment.

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ABSTRACT OF DISCUSSION.

Dr. Frank P. Norbury, Springfield: I have had considerable experience in the types of cases mentioned. The point I think worthy of mentioning is the early treatment during the nascent period of childhood (between the ages of eigth and twelve), when children are more susceptible to training along the line of the emotional reactions and in general physical welfare. I think many of these cases respond to what we may call the unconscious command, in the form of suggestion when the child is in bed and on the point of going to sleep. The mother, nurse or physician, sitting at the bedside, gives the suggestion or command, just as I have practiced it in the treatment of tics. Voice culture I believe is of great importance, and especially learning to sing, whether the child has had any musical experience or not. We all know that the man who stammers or stutters can sing without any difficulty. This is based upon the fact that the stammering individual always speaks in an abnormal voice.

Then, above all, we must study the child from the viewpoint of genetic psychology and thus ascertain all that we can regarding the child's welfare, considering his environment (his home and school life), in order that we inculcate correct methods of thinking and doing. Then again find out about his forebears and thus be forewarned as to his needs for the future.

Dr. Jesse P. Simpson, Palmer: I agree absolutely with Dr. Kenyon's suggestion that there is a great advantage to be gained in treating stutterers early. We had a case in our own family. Our baby, Dorothy, began to stutter when she was about four years old, and we undertook to have all the family cooperate in the cure. So her brother, two years older, agreed that he might help, and we told him that "when little Dorothy begins to stutter, you should ask her to talk slowly, and if she does not do it you will have to punish her." So a few days later Dorothy came to her mother in much distress and reported that brother had whipped her. "Well what did he whip you for?" asked her mother. To which she replied: "C-cause I was a-t-tutterin'." The treatment soon proved effective, however. I think it was not more than a month before we had her broken of the habit entirely.

Dr. Benjamin H. Breakstone, Chicago: I speak with a good deal of feeling on this subject, as I believe that Dr. Kenyon has done us a service in bringing this matter before this body. There is hardly a hamlet or a little town where there are not several cases of

this kind, and the saddest part of it is that we can see a cripple and we sympathize with him, but if we see one of these cases, even among quite intelligent people, we are bound to smile and just snicker at him, and that only tends to increase the trouble. Now, I believe that all of these cases can be cured, if it is not due to an extraordinary cause, and if it is an ordinary cause, whether it is due to faulty respiration, articulation or phonation. If the cause is a removable one, they will be cured as far as the anatomical condition is concerned, but it still leaves the patient with a habit which is the hardest part of the trouble to cure. Habits, as you all know, are the result of environment, and the quickest way to cure these patients is to take them away from the environment which has produced that habit and train them out of it in classes. If you place them among other people of the same kind, where they can sympathize with each other, they will help each other; each one will take care of the other one. It is true of all of us that we pay more attention to any other kind of a nervous ailment, we take care of the habit of St. Vitus' dance, and we take care of other neuroses, but we do not pay any attention to cases of this kind, which are a good deal more important, for the reason that there is nothing that has such a great effect upon the patient's future as this habit.

Dr. Albert M. Wickstrom, Chicago: I have always felt that some of us get up to speak without knowing whereof we speak, but that Dr. Breakstone knows his subject, we all have to admit. For my own part, although it is embarrassing to tell about oneself, I was a sufferer from stammering from childhood up. For a while I was unable to say two words to anyone without suffering from stammering. No one realizes the suffering of a stammering child who has not been through it himself. No one realizes how a child wishes to be alone and often becomes morbid mentally because of this defect. I do not believe, as a good many have said, that a stammering child comes in every case from defective stock. I believe that a good many children coming from good stock receive psychic injuries in early childhood through fright or terrors, as in my own case. I was frightened very badly when I was only about two and one-half years old, so that I was almost unconscious, and after that time stammering began. For the last ten years I have been able to get along without suffering much from it, and I would say that in my case I sought medical help, but no one seemed to understand how to help me. It was a teacher of phrenology that taught me to understand where the weak points lie, and who taught me that I must be educated out of it. It was an oversensitiveness to my surroundings and a lack of self-confidence and self-appreciation that always put me in this embarrassing state of mind, and since learning to understand the cause of it, it has been possible to overcome it, and I want to tell you, friends, that we ought to understand our patients better in order to be able to help them, more especially among the children who come to us with this ailment.

Dr. Elmer L. Kenyon, Chicago, closing: I am especially pleased to have two stammerers face this audience and discuss their own experiences. It helps to emphasize the seriousness of the problem, and I do think that if stammerers themselves would pay more attention to analyzing their own states of mind they might help a very great deal towards solving the etiology of the disorder.

I think Dr. Norbury's idea as to twilight suggestion, or as to suggestion being given at bedtime, is one excellent manner of using suggestion. As to his idea concerning singing, I do not know whether he means the child should sing his speaking. If so, I would quite seriously disagree with him, because for the child to sing his speaking emphasizes his emotion; but I do say this, that the fundamental basis for correct handling of the voice is the same, whether we speak or whether we sing; consequently the same fundamental principles carried out in cultivating the singing voice should be carried out in cultivating the voice in the treatment of stammering. But, of course, we should go further also.

There is much which is omitted in this paper, of course, necessitated by its brevity. The experience of Dr. Wickstrom in having his stammering incited by fright is a very common experience and a very striking factor in the causation of stammering.

RADIUM, SOME OF ITS USES IN SKIN DISEASES.*

FRANK E. SIMPSON, M. D.,
CHICAGO.

Realizing that the remarks to be presented at this time are addressed to an audience some of whom are perhaps not specially trained in technical dermatology, my subject will be approached from a somewhat different viewpoint than if prepared for a company of dermatologists.

Radium gives off spontaneously and continuously two different forces—the emanation and the rays. The emanation emitted by radium being principally used at the present time in internal medicine will not be touched upon. The rays given off by radium affect the photographic plate, cause fluorescence in certain substances and ionize air, thus rendering it a conductor of electricity. They also affect living tissues in a peculiar manner. The rays from radium thus present certain analogies with sunlight and with x-rays. They are not, however, identical with

*Read at the sixty-fourth annual meeting of the Illinois State Medical Society, Decatur, May 21, 1914.

these agents. Radium is used at the present time in skin diseases by simply applying the radium apparatus directly to the skin, so that the rays may penetrate the diseased tissues. Different kinds of radium rays may be distinguished which are known as alpha, beta, and gamma rays. These differ in many particulars, but principally in their power of penetrating opaque objects. The alpha rays are stopped or absorbed by a thin sheet (1/20 m.m.) of aluminum. The beta rays will go through 1 or 2 m.m. of lead, while the gamma rays are not completely stopped by as much as 10 c.m. of lead. This difference in the character of the rays has led to interesting considerations in their therapeutic use. By interposing metal screens or filters between the radium and the skin, the slightly penetrating rays, i. e., the alpha and some of the beta rays, may be absorbed by the metal, while the very penetrating beta and gamma rays may filter through and produce a deep therapeutic action without visibly affecting the skin.

Radium apparatus for use in dermatology is of various types, but the so-called varnish apparatus is the most convenient and effective. In these applicators the radium grains are incorporated in a special fixing varnish and distributed evenly over the surface of a small metal plate. This plate varies in size from one to several centimetres in diameter, while the shape is usually square or round. A single applicator usually contains 5 to 20 or more milligrams of radium sulphate. Instead of metal, the body of the apparatus may be made of linen, to which the radium in its varnish is adherent. This so-called "toile" makes a beautiful and flexible, but very fragile apparatus.

Radium therapy is adapted to many types of dermatoses. Some of these have hitherto been practically incurable. Among the diseases in which it is of great value may be mentioned the following: 1. Epithelioma. 2. Keloids and permanent scars. 3. Lupus erythematosus. 4. Naevi, especially vascular naevi.

These four groups of diseases may be briefly touched upon.

1. Epithelioma. It has now been demonstrated that radium is a very efficient agent in epithelioma of the skin. Up to the present time I have treated about forty cases with success in all but two. In neither of these two cases was I able to carry out the radium treatment with sufficient vigor. The beautiful results to be obtained with radium in epithelioma can only be compared to the similar results that have been obtained with x-rays. Which is the more efficient agent, it would be premature to try to decide. Doubtless both have certain spheres of superiority. Cases have been reported in which x-rays are said to have succeeded when radium has failed. Almost all who have had experience with radium have succeeded in healing cases in which x-rays have failed. It is perhaps one of the problems of the future to determine which agent is best adapted to individual cases.

Radium has by no means taken the place of surgery in the treatment of cancer. All operable cancers with tendency to metastasis should probably be treated by surgical excision. Radium is, however, a great adjunct to surgery, either before or after operation. Cancers of the skin without tendency to metastasis may usually be healed by radium, while the cosmetic result is almost ideal. Inoperable cancers in almost any situation may be subjected to radium to minimize suffering and perhaps prolong life.

Epithelioma of the skin may be healed with or without visible inflammatory reaction, depending largely upon whether one applies the radium unscreened or with a screen. An ordinary epithelioma of the skin two or three centimetres in extent and not too deeply situated may be healed with an unscreened applicator containing 10 to 20 milligrams of radium in six to eight treatments of an hour each. If the radium is screened with 1/10 m.m. of silver, the same result may be accomplished in about ten or twelve hours. It is possible also to heal an epithelioma with only one or two massive exposures of screened radium of several hours each. Generally speaking, it is preferable to use screened radium in many cases of epithelioma in order to limit the inflammatory reaction.

2. Keloids and prominent scars may be briefly mentioned. These usually yield to radium and furnish one of this agent's most conspicuous successes. Certain keloids will melt away even without inflammatory reaction. Even the most refractory keloids, which are often combined with scar tissue, will usually yield to the com-

bined selective and destructive action of radium.

3. Lupus erythematosus is of all skin diseases one of the most capricious and rebellious. Cases will occasionally recover easily under the simplest treatment, or even spontaneously, and other cases will resist almost every therapeutic agent. Occurring, as it usually does, on the face in the form of red, scaly, persistent patches, it forms one of the most distressing and disfiguring of skin diseases. The disease itself frequently produces scars, so that it is difficult to heal cases of long duration with a perfect cosmetic result. Sometimes, however, an almost perfect result can be obtained. Radium promises to be a great addition to our armamentarium in combating this disease. I have now treated over twenty cases. A few have been healed with an almost perfect result, while some have recovered from the disease with more or less scarring. In none has the disease been made worse, an occurrence which is not infrequent with some other forms of treatment. Unfortunately recovery from lupus erythematosus is not always permanent. Relapses may occur after apparent recovery, but these so far have yielded to a reapplication of the radium. The fixed type of lupus erythematosus is the most favorable for radium which must be used in such a manner as to destroy the diseased area.

4. Angioma or nevus vascularis. The results obtained in "birth marks" of various types, including "port wine stains," as they are sometimes called, are better than heretofore obtained by any method. The action of radium in this group of diseases is one of the culminating points of radium therapy. Some types of angioma are amenable alone to radium, while in other types it furnishes the best means at our disposal when one considers the painless character of the treatment and the beauty of the cosmetic result. Flat angiomas (port wine stains) are best treated with "toiles," i. e., with radium having a weak radio activity spread on linen applicators. The curative reaction can be limited in these cases to simple erythema and desquamation. With elevated angiomas a certain amount of destruction must often be produced in order to level the surface and bring about sufficient decolorization. With heavily screened radium even subcutaneous angiomas can now be treated successfully. The painless character of the treatment enables it to be used with special success in the angiomas of children.

59 E. Madison St.

PERSONAL AND CLINICAL EXPERIENCE WITH MILK SICKNESS.*

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Having lived twenty-nine years in a locality that had frequent outbreaks of a peculiar disease or malady almost forgotten by the general public, which a comparatively small number of physicians have had experience with clinically, and owing to the fact that I had the disease myself and lost my father at the same time, four other members of our family being afflicted, the death of one farm hand, the sickness and death of several neighbors, much loss of live stock, such as cattle, horses and sheep, and as I have seen and studied some few cases since becoming a physician, it places me in a position to know of it in many respects.

I have read many articles published years ago on the subject which advanced theories from all points possible, yet to me they seemed to have little or no foundation, due possibly to lack of investigation.

This disorder has had many names suggested by common symptoms or from some theory as to the etiology, yet owing to the fact that a high percentage of the cases were due to the use of milk, no better term could be applied than "milk sickness," while in stock the predominant symptoms being trembling, "trembles" may be a better name.

Many writers, but no authority, have tried to describe a geographical limitation of the area chiefly affected, such descriptions failing from the fact that so little was known of its origin, each writer or investigator forgetting to note the environment of the outbreak and failing to see the relation between the thickly wooded pastures and virgin soil in its primitive state and the wild vegetation thereon.

Osler said: "Little is known of the disease from the fact that about the time that scientists began to study it it ceased to exist." He should

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say now that clearing and cultivation of land have caused extermination to a limited number of cases, yet so long as North America has uncultivated timber land that has climatic conditions favorable to the growth of a certain plant that I will describe later, milk sickness and trembles will exist in proportion, and consequently the medical profession should be kept abreast with the times by those in a position to enlighten them, for at any time they may come in contact with a case far removed from the site of origin or out of season when the plant is unobtainable, being transferred by dried beef, butter or cheese.

The Plant. Eupatorium ageratoides (white sanicle) is usually displayed in the rich soil of the thickly shaded oak ridge near a small stream that is accompanied by a sandy bottom. The more shade the thicker it grows, its season being from July to November, inclusive, blooming in September, a white flower of the corymb type, being a cluster of flowers, each on its own foot stalk and arising from a common axis, each having a fringy bloom. The stalk is from one to four feet high, with a square stem, opposite petioled leaves broadly oval at the base, taper pointed, coarsely toothed, three nerved and veiny, thin and easily skeletonized by insects that enjoy the leaves of this clan of plants. They grow in pairs from alternate sides of the stalk, so that each pair of leaves are at right angles with the pair below or above it. Just before and during the time of blooming the honey and other small bees, wasps, etc., cut many holes in the leaves, using the parts for honey combs. The blue butterflies frequent the bloom, gather nectar and transfer the pollen. The roots are many, all about the same size, varying from four to twelve inches in length, are pearly white, spread out, and grow only about three inches deep, wilt and turn brown almost immediately after being pulled, then become wiry-like. The plant thrives well in dry weather, the leaves and stem look very green when neighboring plants are parched, and if cut the stems may be kept growing in a basin of water from six to eight weeks, yet no roots on the stems, while the part in the water turns black.

Pasture and Live Stock. During the dry season, when all grass is gone, heat intense and flies numerous, the herbiverous animals are driven to the thickly shaded places to knock off the flies with the thick brush and weeds. So rather than to venture out into the open again they browse wild plant life that is more green and juicy, and if the Eupatorium Ageratoides be present it is found that it is more bitten than any other foliage. After noting this fact and losing many cattle, sheep and horses, I procured three head (two young cattle and one sheep) that were healthy, proven so by chasing them, also they had not been in wild pasture, fenced them in a barren lot and compelled them to eat the plant, cut fresh at each feeding. Within three days all were dead, symptoms and signs being identical with those that had died previously.

Symptoms and Signs of Trembles in Animals. This I cannot take up in detail owing to lack of time, but because of the similar symptoms to the disease in man it is necessary to give a gist of the predominant symptoms and physical signs I noted in cattle, horses, mules, sheep, dogs, buzzards and hogs.

Cattle. The first manifestations noted are listlessness, indifference to food, yet will try to drink, and disinclined to move about, holds head low and watches the ground as it steps (as man with ataxic gait). Eyes have a glaring, protruding appearance; is unable to walk straight and fails to keep pace with its fellows, stops to rest, attempts to evacute bowels, muscles of shoulder quiver, and front legs seem weak while the hind legs are stiff, is unable to walk across old corn rows or uneven ground, falls and lies panting, is unable to rise, if tame will allow help to get up, while if wild they will try to fight and die from the exhaustion. These first characteristic signs pass into the more severe symptoms of the second stage of great weakness and clonic contractions. If able to get up the front legs seem too weak to hold its weight and the extensor muscles paralyzed, causing the flexed position till death occurs, while the hind legs remain extended, yet many clonic contractions of the muscles are noted. Its neck is usually twisted to one side, some of the muscles hard and stiff, later in the stage the head is extended; the eyes are red and protruding upward accompanied by a gummy yellow discharge. The breath has an acetone odor in all cases. Sometimes if the animal be wild or is disturbed it may have a thin muco-bloody passage of the bowels which has a similar odor as the breath; the majority die, never having had an evacuation of the bowels. The milk cow is less likely to die as she seems to eliminate the toxic product through the milk yet she may have all the first signs noted in steers and if caused to go dry she will die also. The milk of the affected cow has neither unusual odor nor taste. The cow may be driven quite a little more than other animals and show scarcely any signs of exertion, yet her milk may be very toxic and may

cause the death of several using her milk before she is suspected as being the contributing cause, but after close observation and severe exercise she will give off the same fetid odor as other animals except the hog and dog which give no odor, this being attributed to the lack of sweat glands. The pulse is very irregular, temperature always from one to two degrees lower than normal, gastro-intestinal tract distended with gas, a slight groaning is heard, Cheyne-Stokes rhythm of breathing is noted. During this stage signs of pain are manifested and a continuous movement of one of the front limbs is noted while in the semi-conscious condition, finally in the last five to six hours all consciousness is lost and death seems painless.

Horses. Losing five head of various ages in the late summer months during a period of three years, it naturally caused me to spend some time on the study. A colt was the first victim and had died with similar symptoms as described in cattle, its mother's milk being the cause, yet she did not manifest any symptoms of sickness until hitched to a load (about the time the milk was failing) when she stopped, failed to respond to the whip, fell and never got up, died in nine hours. Before she fell trembled all over and after falling had clonic muscular contractions of the front legs, digging grooves in the ground with the movements, held her head to one side, at times groaned, then would stretch out flat and strike with front feet, these symptoms finally abating and was apparently unconscious until death, eyes, respiration, odor and temperature similar to that just described in cattle. Other horses that died were affected similarly to steers, beginning by the slow drooping, wavering gait, finally got down and were unable to rise, none of them living over seven days.

Mules did not seem much affected, as none died and only two showed marked signs, one a nursing mule was slightly affected at the same time with its mother, but neither died. Both had the first stage symptoms. The other mule showed "trembles" when hitched to a plow, but after a few days' rest seemed to recover. Its predominant symptoms being slow movements, droopy, trembling and failing to eat. I have heard of several sick mules but no fatalities, neither have writers mentioned any deaths. I attribute this partly to the nature of the mule in regard to eating. They are more particular about what they eat and never overeat. And the Eupatorium Ageratoides when bitten or crushed gives off a peculiar disagreeable plant life odor that seems to discourage the mule from eating it. The sheep is guarded against eating this plant from its odor, while horses and cattle seem to pay little or no attention to plant life odors and will eat anything green.

Sheep. I only lost four out of a herd of seventy, aside from those killed by the feeding experiments, although many seemed as farmers speak of it "off their feed." Those that died had similar symptoms to the cattle, the predominant symptom being to lie flat and dig grooves in the ground with their feet.

Buzzards partook of the carcasses of both cattle and horses. Some of them died, some were slow to fly when I approached, but owing to their nature I had no opportunity to study their symptoms.

Dogs. Our dog and two tramp dogs which had eaten the flesh from the carcasses of the horses died within three days. The two tramp dogs were never able to get off the farm, vomiting and weakness being their worst symptoms.

Hogs. One sow which had eaten the flesh of one of the cows that had died did not seem affected but four of her seven pigs were sick, being bloated and breathing rapidly when lying stretched out. They were unable to suck or follow their mother for three or four days, but finally recovered.

Cases. After the man had died of milksickness, near West Newall, Ill., last August, the family quit using the milk and fed it to the pigs two and one-half months old; three were made sick and would not drink the milk. All recovered. Their symptoms being similar to other pigs mentioned.

In the cases near Jamesburg, Ill., last October, I chased the family milk cow until she showed marked symptoms of trembles, her milk was fed the cats and all were made sick; also a sow was fed her milk and the seven nursing pigs all died. Symptoms of trembles as described were noted.

In the Flora, Ill., cases last August, after close observation, the family milk cow appeared all right, which is often the case, especially seven weeks after the first case was diagnosed, yet the mules were still in the same pasture as the cow had been and were reported sick when hitched up to plow only a few days before I saw the third case.

The cases near Rinard, Ill., my father being the first, began with vomiting and died within five and one-half days. My mother and two sisters were seriously sick at the time of his death, but all three recovered slowly. One sister had a second attack two years later and again recovered, yet at this time the hired man died in three days from the onset of the vomiting. I was the next patient and began suddenly with vomiting, having no ill feeling the day before; vomited three days and nights continuously, then began to improve slowly, yet after my apparent recovery I noted for many months any unusual exertion brought about weakness, shortness of breath and trembling, also overeating would cause me to vomit.

A neighbor whose farm adjoined ours had three sons sick with the same malady, two of whom died.

Of the seventeen cases mentioned at the four locations nine were fatal and the origin of all could be traced to the milk cows and in each of the six pastures mentioned the Eupatorium Ageratoides was present in large quantities and had been bitten more than any other plants, and in fact were the greenest plants to be found in the pastures.

Immunity. Nothing is immune, but the herbiverous animals seem more susceptible and more fatalities are reported than in the carnivorous, and neither acquire immunity by an attack.

Also man may have repeated attacks, or relapses due to the cumulative properties of the intoxicant.

Postmortem on two horses and one cow. All showed a capillary injection of the lining of the gastro-intestinal tract, the intestines being loaded with food they had eaten before showing signs of illness, also bloody mucus was present. Other organs appeared normal, except the liver was congested and enlarged.

THE DISEASE IN MAN.

Predisposing Factors. Judging from personal experiments, much clinical study and a preponderance of evidence obtained from other investigators, I believe that this disease is an intoxication, rather than an infection, as is believed by some who have thus far failed to prove that they have found positive bacilli, and also those that have advocated the mineral (alkali) theory have more than failed.

Water need not be considered as a factor, even though some writers mention a dry season following an overflow, or wet season, others speak of marshy places, sloughs, etc., but this theory will not hold out, as I have visited many pastures containing the plant that had neither stream nor marshy places and were too high for an overflow, the stock drinking well water. Yet they were victims of trembles. Then, too, other stock drinking the same water, but running in another field, never showed the least signs of illness.

In one family five of the seven were sick. All drank the same water, but the two that escaped never used milk or butter, while the five did. One died; also the suckling calf of one of the milk cows died.

I have made many microscopic examinations of cultures, blood and urine, in the recent cases and was unable to find present the bacilli described by Prof. E. O. Jordan in his writings in 1909 on Milksickness, and he is the only investigator or writer, out of 167 since 1810, that has attempted to prove the etiology by an isolated specific micro-organism. Then owing to the fact that the bacillus in question belongs to a group which seems widely distributed and has not been proven to be endowed with pathogenic qualities, he has about abandoned the germ theory of etiology, and nothing has been written on this subject since his writing in 1909.

Herbivorous animals being first affected and especially the cow, carnivorous animals then develop the malady when fed on the carcasses. The disease is in a way self propagating and I have noted under some conditions may be passed on from one animal to another by being fed on the milk or meat of its predecessor. This may be explained from the fact that the fatal case had a maximum dose of the intoxicant and the tissues have a complete or near saturation, thereby transmitting to the second or third animal by his eating the meat.

Season.—Beginning in August of the extreme dry years and continuing to the latter part of October, cases are more numerous and this time is when the plant mentioned is in its thriving condition, also it is a plant that dry seasons seem kindly to its growth, yet it must grow in the shade. Many cases have been reported out of season, and where neither the plant grew nor trembles in livestock existed. These can be accounted for by the use of cheese, cured or dried beef and possibly honey from bee trees.

Now with this in mind I will take up the disease in man as an intoxication from the alkaloid or active principle of Eupatorium Ageratoides, being transferred to man through the medium of milk, butter, cheese, beef and pork, and occurring in frequency in about the order named.

Intoxication Period.—This is usually about two to five days and judging from the physiological action of the poison it seems to have cumulative properties and then begins to act suddenly. In many cases no premonitory symptoms are noticed except a few hours of weakness.

Acute Symptoms and Physical Signs.—These begin by anorexia, languor and fatigue, later nausea and vomiting. The patient is unable to take food or water owing to the pernicious vomiting which may be continuous from one to two or three days when complete exhaustion is followed by restlessness and mental dullness. This is followed by semi- or complete unconsciousness, obstinate constipation, urine scant with pale color, pain in the abdomen as the case progresses and at times referred to the calves of the legs followed by stiffness, hiccough, dysphagia. Extreme thirst is the rule and the patient's breath

has a fetid odor with a similarity to acetone or chloroform which is the most characteristic diagnostic symptom of the malady. When the patient is directed to protrude his tongue a decided tremor is noted, the tongue is red, unusually large and later becomes sore and parched into fissures; pupils react sluggish, ocular conjunctiva reddened, eyes rolled upward in the semiconscious state and a yellow gummy discharge at each canthus; abdomen scaphoid and later tympanites occur; convulsive seizures are occasionally observed; patient usually lies on the back with the head turned sideways; legs drawn up with the knees spread apart, tendon reflexes sluggish; skin cold and clammy; pulse irregular, varying from 70 to 120; temperature subnormal, rarely exceeding 99°; blood pressure about 95 and falling as low as 67; respiration irregular and of the Cheyne-Stokes character.

Sub-Acute or Chronic Signs and Symptoms.—This form is about the same as the acute, produced by the same cause but differs in degree. The patient is languid, only vomiting by spells, at times seems a little better than others, yet unable to exert body or mind; appetite varies as to food or thirst, may eat, but the eating causing a relapse; bowels are sluggish; palpitation of the heart at times; stiffness of the legs with cramps in the calf muscles; liver enlarged; skin wrinkled and yellow; sweat and breath having the acetone odor; tongue swollen, clean and red; no reflexes; tender over jejunum and illeum, gas gurgling in that region; respiration irregular; marked emaciation; eyes half open and conjunctiva yellow. May vomit blood or pass bloody stools; blood pressure as low as 70 (one case the blood pressure was 67 and when blood presure runs that low the case is fatal, and I might mention here the fact that in these cases the blood pressure is the lowest on record, even 5 to 7 m.m. below typhoid cases, which up to this time has held the lowest records.) Low blood pressure may be explained as due to the dilation of the gastro-intestinal vessels, also the dilation of the central veins of the liver, adding their effect to the cutaneous vaso dilation. Temperature usually subnormal, but at times may reach 100°, or possibly higher just before death due to some complication. This stage may exist for months or may be transformed at any time into the acute by over-exertion or overeating. If convalescent, weakness and trembling is noted and if patient attempts to run the adductor muscles relax and at each step the feet get farther apart until he falls.

Diagnosis. 1. *Differential.*—The vomiting is similar to pernicious vomiting in pregnancy in the subacute stage, but this mistake can be avoided by careful history. Other symptoms are not characteristic of any other malady and by careful examination no excuse can be offered for a mistaken diagnosis. Note.—Vomiting of pregnancy is often accompanied by acetone and diacetic acid in the urine.

2. *Clinical.*—The appearance of the tongue, odor of the breath, vomiting and subnormal temperature.

3. *Laboratory.*—This should be closely noted, yet little is gained by the effort only to eliminate suspicious etiological conditions. This I had in mind and made repeated examinations of the milk, both chemical and microscopical, but in all cases no trace of the bacilli lactimorbi as described by one writer were found.

Feces.—Acetone odor and acid reaction.

Urine.—Pale, scant, acid reaction, Sp. Gr. 1020 to 1030, traces of acetone, also albumin. The fact that some had no albumin might be attributed to the free use of sodium chlorid in the treatment, as its use will diminish the quantity of albumin as in acute nephritis.

Vomitus.—Mucoid tenacious material with acetone odor, acid reaction and later may contain blood.

Blood Examination.—White cells from 8,500 to 9,400. No leucocytosis.

Relative count made the 9th day of the illness:

Lymphocytes, 11.8%.
Small Lymphocytes, 4.95%.
Large Lymphocytes, 5.2%.
B. P. cell, 1.65%.
Polyneuclear, neutrophyles, 87%.

Laboratory tests and animal experiments will be given in the complete article with case reports.

Pathology.—It is a malady showing little or no pathology except the mucous membrane of the stomach and intestines show injection of the blood vessels, and the organs themselves contracted; Pyers' glands show unusual redness. In the subacute or chronic cases the liver is enlarged, presenting a high degree of fatty degeneration,

the central veins dilated and filled with blood and bile ducts compressed.

Prognosis.—The outlook is very grave in both the acute and subacute cases. The acute usually die between the second and ninth day. If there is any predispositon to tuberculosis the time is never better for the work of the tubercle bacilli as in the subacute cases. If not tuberculous and the patient is sick many weeks or months, the tendency is to become permanently demented or die from cardiac failure which gradually develops.

Prophylaxis.—If possible clear the ground and plow it to destroy the plant, or burn over the woods after the leaves have fallen. Avoid the use of thickly wooded pastures during the dry seasons. In case of sick cattle avoid the use of milk, and in case any stock are lost, burn them.

Under this head I want to mention the outbreak in Newcastle, near London, England, January 24, 1914, just to illustrate the serious condition which may follow the contamination of so important an article of food as milk. In this outbreak, which was not milksickness, 523 people were affected, some becoming seriously ill and the cause traced to one cow's milk. The farmer thought the cow had only an ordinary bad cold.

Treatment.—Owing to the active principle of the plant having a marked affinity for alcohol, nothing is better than the use of alcohol as an antidote to the degree that its physiological action is noted (intoxication). Avoid purgation. Use sodium chlorid and sodium carbonate, equal parts, 15 grams to the pint per rectum, every two hours. In the subacute cases castor oil may be used in addition to the above and one of the first foods successfully used is salt cured meats with fruit wines.

Conclusion.—To sum up the abundance of evidence is to me quite positive proof that milksickness is an intoxication from the active principle of the Eupatorium Ageratoides. It now becomes necessary for those who call it an infection to explain the subnormal temperature, absence of leucocytosis even at the tenth day of the illness, absence of local or general infection in man from doing post-mortems. Owing to the fact that nothing has been written on this subject since 1909 and that by a laboratory man, I do not consider of much value simply laboratory deductions without clinical knowledge and continuous personal observation of the disease.

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DISCUSSION.

Dr. A. A. Goldsmith, Chicago: I have had no experience clinically with the disease under discussion. However, seven or eight years ago I had the opportunity of examining specimens of the parenchymatous organs from two children, brother and sister, who had died in New Mexico after a few days' illness from milk sickness. Microscopically there was an extreme grade of necrosis found in the liver and kidney. I am rather surprised, therefore, not to hear more about this in the present discussion of the subject, as it was my impression that this is a common finding in this disease. I would like to enquire as to whether the plant grows in a more scattered way than I was aware of. I was always led to believe that the disease in America occurred chiefly in two locations: Illinois and New Mexico.

IMPERFORATE ANUS.*

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The subject of Imperforate Anus usually considered to be of surgical or of anatomic interest, only, is rapidly becoming of more interest to the general practitioner, as it is he who first discovers the anomaly and is expected, not only to be perfectly familiar with the statistics as regards its rarity, but also, what chance has the child to live and with how much comfort after operation. These questions will be immediately asked you by the anxious parents and they have a perfect right to know.

Originally the intestine consists of an inflection of the hypoblast which extends from one end of the embryo to the other, and is located just below the primitive vertebral column. At either extremity it forms a closed tube which is divided into three parts—a front part, or foregut; a posterior part, or hind-gut; and a central part, or mid-gut.

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The ends of the fore-gut and the hind-gut do not communicate with the surface of the body. The buccal and anal orifices are later formed by involutions of the epiblast, which subsequently form communications with the gut. The anus is formed by an inflection of the epiblast, which extends inward to a slight extent and approaches the termination of the hind-gut and finally communicates with it by a solution of continuity in the septum between the two. The persistence of the fetal septum at the anal orifice constitutes imperforate anus.

Just what it is that takes place to cause arrested development in the alimentary canal in the fetus and which causes such a terrible and distressing malformation in the new-born child is not clearly known. The thread-worn and time-honored theory that syphilis is the cause has been disputed on good ground, since it is proven beyond question that the anomaly is of comparatively frequent occurrence in the lower animals. Seldom if ever in the negro.

In discussing this subject, Ballantyne and others make a sharp distinction between fetal and embryonic pathology.

During the first eight to twelve weeks, which is considered to be the period of embryonic life, the alimentary canal has assumed the form it takes at birth and it is at this period, that of organogenisis, that arested development takes place and it is not thought to be due to the usual pathological alterations, but to perversion of development due to pathological conditions elsewhere.

There is a close relationship between deformity and disease, and while we are deeply ignorant as to what produces this and that deformity, we do know that abnormal development of the amnion, with the formation of adhesions, in the embryo would be a very plausible reason for the anomaly imperforate anus.

Again, the conditions which might take place, even after the rectum is perfectly formed, could cause certain deformities and in this regard fetal peritonitis with resulting adhesions and constricting bands should be taken into consideration.

Classification. Under the head of classification, I will take up:

1. *Narrowing of the Rectum or Anus Without Complete Occlusion.* The stricture may be of variable degree from one of very slight narrowing of the lumen of the bowel, causing only slight symptoms, to one allowing only a slight amount of meconium to pass and causing very severe symptoms, such as distension of the abdomen and vomiting. These strictures are quite characteristic and generally linear, resembling a deformity produced by tying a band around the bowel and are also usually located low down, making diagnosis easy. The anus may also be narrowed in much the same manner as the rectum.

2. *Membranous Closure.* This is one of the most simple and most rare forms of imperforate anus. The membrane may be composed of mucous membrane above and skin below, in which case there may be a slight depression to correspond with an anal opening or the median raphe may extend over the spot in an unbroken line. There may be a double septum, in which case always the uppermost one is composed of mucous membrane above and below.

There may be a rudimentary sphincter or there may be no trace of an anus, the proctodeum being quite undeveloped.

3. *Absence of a Part or All of the Rectum.* The rectum may be entirely absent, or it may end in a blind pouch, which may hang loose in the free peritoneal cavity, or it may be found at some distance from the perineum, where it may be firmly imbedded in the tissue surrounding some organ, such as the prostate or the kidney, or it may be found at a variable distance in the perineum firmly imbedded in the tissue of that body. The anal site may be smooth or there may be a slight depression to correspond with a normal anus, or the anus may be perfectly formed and end in a cul-de-sac.

4. *Imperforate Anal Canal with Vulvar Outlet.* According to Ball,[1] the most common form met with, most of the vaginal forms reported are of this type. In many such malformations the abnormal anus may functionate efficiently.

5. *Imperforate Anal Canal with Perineal, Sacral or Suburethral Outlet.* In these cases

there may be exactly the opposite condition to that of absence of the rectum, inasmuch as the rectum may be elongated and emerge at any point along the perineum, external and internal genital folds, margin of the vulva, underneath the scrotum or penis. In these cases the opening is not sufficient to allow complete fecal evacuation.

The rectum may open into the bladder, vagina or uterus.

In addition to the above classification, there is often associated with these anomalies other deformities, such as horseshoe kidney, double kidney pelves, double ureter and deformity of the bony pelvis.

Congenital malformations of the rectum and anus are rare. Concerning this Leichtenstern[2] says: "Congenital occlusion of the rectum, in which there is absolutely no anus formation, has been observed but three times in 66,654 new-born children." "Congenital artesia of the colon or small intestine is still more infrequent. Of 375 collected cases, 10 were of the colon and 74 of the small bowel." The atresias of the colon are almost exclusively situated in the illiac flexure; those of the small intestine at the ileo-cacal valve and duodenum."

Collins, in the Maternity Hospital, Dublin, saw only one case of imperforate anus in 16,000 births.

County of Havre, France, observed three cases in 35,000 births.

Zobie, of the Vienna Maternity Hospital, 2 cases in 50,000 births.

The Paris Maternity Hospital records show 5 cases in 20,600 births.

Surgical treatment for the relief of the anomaly has been practiced for very long, even from ancient, times. This treatment was usually puncture or simple incision. In 1835 Amussat employed the first true proctoplasty. He carefully resected the perineum; the rectal ampulla was carefully detached and drawn down to the perineal incision and the mucosa sutured to the skin margin.

Litre instituted the method of illiac anus and Collison that of reaching the intestine by way of the lumbar route, and various other methods have been employed by other operators.

The ordinary simple incision, while it may allow the escape of meconium and prolong life, does not result in even a useful anus for any length of time. This operation may be modified by bringing the rectum down, after carefully dissecting it loose, and stitching to the skin, and to facilitate this, where the rectum is too short the coccyx may be removed and the bowel take its place.

In event of failure to establish a new anus in the perineum, colotomy should be undertaken at once. I quite agree with Norbury,[3] who thinks that the incision for colotomy should be made in the median or paramedian line, for one cannot be sure how much of the bowel may be wanting.

In regard to a secondary operation in the perineum after colotomy, most operators report a large percentage of failures, but at the same time in cases where the patient is one of good vitality and has attained not less than the age of six months, and where the artificial anus in the groin is objected to, and where the conditions are otherwise favorable, this operation should be undertaken. The operator has the advantage of the opening above, thereby enabling him to pass a sound as a guide down into the pouch at its most dependent portion, when it is comparatively easy to find the bowel and after a time the opening in the groin can be closed.

Bodenhamer[4] made a very complete examination of a large number of cases of imperforate anus and collected data from authentic sources referring to 465 cases. His tables are verified up to the date of his work. He also made a very elaborate differential classification of the various types.

His statistics are: Number of cases examined from all sources, 465; males, 230; females, 130; sex not stated, 102; number of cases treated, 345; number of cases successfully treated, 160; number of cases unsuccessfully treated, 185; number of cases not treated, 120.

Curling collected 100 cases, 68 of which were males, 32 females.

Bouisson[5] collected 100 cases, 47 of which were males, 53 females.

Bodenhamer states that he found 51 cases where Littre's operation had been done. Twenty-one of these were successful, 28 unsuccessful, 2 unknown. Lumbar colotomy was performed in 16 cases. Successful, 6; unsuccesful, 10.

The analysis of cases by Cripps[6] and Ashurst[7] shows that the mortality for colotomy is 65 per cent and for perineal proctoplasty 22 per cent.

Hardouin[8] made an important investigation into the subject and he collected altogether reliable particulars of 223 cases. They are as follows: Treated by simple incision of puncture, 53 cases; treated by Amussat's method (proctoplasty), 73 cases; treated by other methods (perineal way), 8 cases; treated by Littre's methods (illiac anus), 63 cases; treated by Collisen's methods (lumbar method), 10 cases; treated by combined methods, 16 cases; total, 223.

Of these 124 died within 1 month (99 in 1 week); 15 died within 1 year; 51 results not determined (5 believed to be good, rest lost to view); 30 have lived in good condition more than 1 year; 3 still living at time of report (less than 1 year); total 223.

Of the 30 surviving more than 1 year 14 are from 1 to 10 years; 6 more than 40 years.

From these results it is seen that 55 per cent passed the first week after operation; 44 per cent passed the first month after operation; 23 per cent passed out of view; 13 per cent passed the first year; 6 per cent passed more than 20 years.

The operative procedures of Littre have given better end results than the others, but the dangers in it and the other methods are stricture, incontinence and prolapse.

In Bouisson's statistics there were 21 illiac operations, with 7 recoveries, 8 deaths and 6 unknown. Recoveries ranged from 17 to 47 years.

Anders[9] reported 100 cases: Proctoplasties, 44; recovery, 31; death, 13. Colotomies, 21; recovery, 10; deaths, 11. Not reported, 3; recovery, 2; deaths, 1. Simple incision, 32; recovery, 21; deaths, 11.

Two very unusual cases have been recently reported. Pfeiffer[10] reports a case of anus in the vulvar vestibule. This is one of the rare forms, as there appears to be only 34 similar cases known, and only 11 of these women bore children. The muscles of the vestibular region were strong and insured continence. No operation was undertaken and the woman remained quite comfortable up to the time of the report.

Smiley[11] records the case of a woman, aged 27, who had an imperforate anus. The rectum opened into the vagina about 2 inches from the vaginal orifice, there being an elliptical sphincter which was of sufficient strength to give control of the bowel. This woman was delivered of a 9-pound child and after delivery made an uneventful recovery.

Mueller[12] had two cases in which perineal exploration failed to locate the bowel. In one case the illiac sigmoid was found at the crest of the first sacral vertebra in a cul-de-sac. In the second case the sigmoid was found to terminate in the cecum at the superior portion of the lower pelvis. In one of these cases there were other congenital anomalies, a fact which is very common in all such cases, the child having a horseshoe kidney with two kidney pelves and two ureters.

Mueller advises laparotomy for all cases not discovered by perineal dissection; also he says the rectal ampulla should be sought in the sacral cavity.

Clogg[13] reports a case in which, owing to the entire absence of anus and anal canal, and from want of any indications as to the position of the rectum, immediate left illiac colostomy was performed without any previous attempt by way of the perineum. At the age of 6 months perineal exploration was made and the rectal ampulla was found and the bowel terminated opposite the base of the prostate, to which it was firmly adherent. The bowel was made freely mobile, the peritoneum being freely opened to accomplish this. The rectum was opened and its cut edges sutured to the skin of the perineum. The colostomy was closed two months later.

Clogg lays stress on the following points for all such cases. 1. The advantage of immediate primary colostomy over perineal dissection when the bowel terminates at some distance from the perineum. 2. Importance of avoiding tension by freely mobilizing the bowel before suturing it to the perineum. 3. The loss of sphincteric control, owing to the absence of proctodeum and consequent non-development of the sphincter ani.

Chenhall[14] reports a woman, aged 36, operated upon in infancy for imperforate anus (the description of the operation not given), never had control of her bowels and of recent years was compelled to wear a rubber protector over the anus. For some time life had become almost unbearable in the erect position owing to prolapse of the bowel. Chenhall operated on her by suspending the sigmoid to the anterior abdominal wall. Ten days later he carefully divided the circumference of the mucous membrane at the anal margin. This he stripped up a short distance, opened the peritoneum on the left side freely and immediately pushed back the prolapsed bowel. This procedure was repeated on the right side. The loose part of the bowel was then drawn down and the peritoneum closed, its attachment being made to a point much higher on the bowel. When this had been accomplished, the whole of the bowel below the anus was amputated, the proximal end being stitched to the anal margin. The result gave perfect satisfaction.

I wish to report two cases which I have encountered in my own practice.

The first case is one of the membranous, which is one of the most rare but simple forms. Child born without anal opening but with the symptom of bulging over the point which is almost positive proof that the bowel is superficially located which proved to be the case on simple incision. In this case I made the incision without an anesthetic.

The following day the child was anesthetized and the cut edges of the rectum brought down and stitched to the skin. In this case there was a weak sphincter ani and the child at four years of age has no difficulty save at times when the contents of the bowel are of liquid form. There has been no prolapse. This case is of interest only in regard to its rarity.

The second case is that of a male child born Feb. 14, 1914. Weight at birth 9 pounds. Child born with imperforate anus and a fistulous communication between the rectum and bladder, the child passing meconium by way of the urethra. At the anal site there was a slight depression but no bulging on straining. Twelve hours after the child's birth I undertook an operation by way of the perineum in hope that I might locate the rectal ampulla but after diligent search and being handicapped by poor light and no assistance, the case being in the country, I was unsuccessful and ordered the child sent to the St. Anthony Hospital, Rock Island, where Dr. E. M. Sala resumed the perineal operation and was rewarded by finding the bowel which was located in a small opening which would correspond to the pelvic outlet to which it was firmly adherent. This opening was explored with the finger and found to be decidedly narrowed by what seemed to be a deformity of the bony pelvis. The bowel, after a delicate dissection, was sutured to the skin of the perineal incision, the wound cleansed, a tube inserted and packed around with sterile oakum.

Baby did well for three weeks when a complete stricture occurred at the artificial anus. He was again anesthetized and an effort made to enlarge the lumen of the opening through the bony pelvis whereby we would be enabled to do a more complete dissection of the rectal ampulla in order to bring the rectum down without tension being made which was the cause of failure of the first operation, in this we were quite successful, and in making the incision in the perineum which was made up and down and the two points of incision being brought together again modified our first operation and increased the lumen of the opening.

Tube was inserted and as in the first operation firmly stitched to the skin, but in neither instance did it remain to exceed 24 hours.

Child still has to have the opening dilated. Ether was used for both operations.

This case is of interest on account of the communication between the rectum and bladder, also, on account of the deformity of the bony pelvis.

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FURTHER ADVANCEMENT IN OUR STUDIES OF SYPHILIS.*

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Although a wonderful advancement has been made in the treatment of syphilis, comparatively few realize the role that the early diagnosis plays in the cure of the patient.

Many staining methods for the detection of the spirochete have been recommended as short

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and reliable, but none has as many advantages as the dark field condensor, as here the demonstration of the living spirochete is characteristic and distinct. From an experience dating from the year 1908, consisting of many hundreds of examinations, the writer considers that the one and only method for use is the dark field condensor. The advantages of this method depend upon the illumination which is greatly facilitated by the new Nernst lamp. This style of lamp has the advantage over the arc light, in that it gives a continuous strong light with no breaking or closing of the circuit or burning out of carbons.

Noguchi's method of snipping out a small piece of the lesion and macerating it with salt solution in a mortar offers an excellent way of obtaining the organism in large quantities, for in this manner they are expressed from the lesion and appear abundantly.

The universal procedure of making a smear from a lesion the same as one would do in making an ordinary pus smear, should be emphatically condemned as it is absolutely impossible for the laboratory in this way to do itself justice.

There are two things during the presence of the primary lesion that we wish to know.

These are—

1. The result of the Wassermann reaction on the blood as a guide to future treatment.
2. The result of the spinal fluid examination as a control on future complications of the nervous system.

1. *Wassermann Reaction On the Blood.* For example—a patient presents himself for examination. Diagnosis is made by finding the spirochetes in the primary lesion. Assume the Wassermann examination is negative. This shows that the system is not involved to any great extent and the possibilities of a speedy cure are good. On the other hand, take a similar case in which the diagnosis is made by finding the spirochetes in the primary lesion, but with the Wasserman examination positive. This shows a considerable systemic invasion and is not so favorable for a speedy cure.

It is not a generally recognized fact that the consumption of even small quantities of alcohol, if taken from one to seven days before the Wassermann is made, tends to influence the test by producing a false negative reaction. Attention was first called to this by Craig and Nichols[1] of the United States Army, and since then it has been verified by serologists all over the country.

Where a doubtful or distinct clinical history is given, a negative Wassermann on the blood should not be taken as conclusive evidence that syphilis does not exist, but to this should be added a complete spinal fluid examination. Should this likewise prove negative, a provocative salvarsan should be given and Wassermann examinations on the blood should be made 24 hours, 48 hours, 7 days, and 14 days afterwards.

Should all these show negative, the patient may be considered as not having the infection.

2. *Spinal Fluid Examination.* During the past two years, numerous observers both in this country and abroad have called attention to the fact that the nervous system is already involved in early syphilis, a thing almost undreamed of before this time. This involvement seems to be due to a selective type of spirochete and it becomes our duty to puncture the spinal canal if we wish to control the situation here as well as in the blood stream.

This spinal fluid examination consists of the following:

1. Wassermann reaction.
2. Cell count.
3. Globulin reaction { a. Noguchi. b. Nonne—Apelt.
4. Pressure.

Technique. Lumbar puncture is always performed best with the patient lying on his side. Inasmuch as 5 c.c. of fluid are essential for a proper examination it is advisable to perform this puncture only in a hospital. During the withdrawal of the fluid, the patient's head should be absolutely flat (without pillow) and continued so for twenty-four hours with the addition of the elevation of the foot of the bed after the patient has been removed from the operating room.

1. Wassermann reaction. Of all the tests, the Wassermann reaction on the spinal fluid is the most reliable. Frequently, however, an error has been made in taking too small a quantity of this fluid: at least seven times the quantity that is required for the blood Wassermann is absolutely essential for accurate results.

2. Cell count. The following standard of Dreyfus[2] based on 750 punctures is recommended

by Ellis & Swift of the Rockefeller Hospital:

1 to 5 cells per cmm.—Normal.
6 to 9 cells per cmm.—Doubtful, border cases.
10 to 20 cells per cmm.—Slight lymphocytosis.
21 to 50 cells per cmm.—Moderate.
Over 50 cells per cmm.—Marked.

Technique of Leucocyte Count of Spinal Fluid. The apparatus employed is the Turck. The spinal fluid to be tested is thoroughly shaken. Draw up in the white cell counting pipette 10 per cent. acetic acid to the mark 1, then the spinal fluid to the mark 11. This gives an employment of 9 parts of spinal fluid in 10 parts of the mixture or 9/10 of the mixture is spinal fluid. Blow out the first few drops of the solution from the pipette and then place on the chamber just sufficient fluid so that with pressure of the cover glass Newton's rings appear at the four corners. Count the cells in the whole ruled area. Since the volume of each large square of the Turck ruling is 1/250 cmm. and as there are 144 large squares in the ruled area, the volume of spinal fluid in the count is 144/250 cmm. The number of cells in this volume represents the cells in 9/10 spinal mixture, therefore in 1 cmm. volume of straight spinal fluid are multiplied the cells counted by the inverted fractions $250/144 \times 10/9$, giving a constant multiplying fraction of approximately 50/27.

3. Globulin. This may be made after the method of Noguchi or the method of Nonne-Apelt.

a. Technique of Noguchi Butyric Acid Test. To 0.2 cc. spinal fluid add 0.5 cc. of 10 per cent. butyric acid in physiological salt. Boil carefully over a small flame for a minute and add quickly 0.1 cc. of normal sodium hydrate and boil again for a few seconds. In the presence of excess globulin, a precipitate forms of varying intensity, depending on amount of globulin present. A cloud may appear in normal fluid.

b. Technique of the Ross Jones Modification of the Nonne Test. Float on top of about ½—1 cc. of supersaturated (by heat) ammonium sulphate solution, about ½ the quantity spinal fluid. In the presence of excess globulin a white ring forms. In case of small quantity of globulin, if the ring is either absent or indistinct, shaking the tube will cause the clouding to become prominent.

4. Pressure. Pressure is estimated by allowing the fluid to run into a graduated manometer tube with a bore 3 millimeters in diameter, and reading the height to which the fluid rises. This figure is only relative.

Necessity for Spinal Fluid Examination in Syphilis. Ever since the discovery by Noguchi[3] that the cerebrospinal fluid in paresis, cerebrospinal syphilis and tabes contains live active spirochetes that are capable of being transmitted to animals a new light has been thrown upon subarachnoid involvement. How this involvement takes place is not exactly known, whether the spirochetes are capable of passing through the choroid plexus, or advancing along the lymphatics that accompany the nerves, future investigation will have to determine.

There is little doubt, as Mott[4] has already shown that there is a selective type of organism that has a predilection for the nervous system. The all absorbing question is, how are we going to get rid of the infection, once it has anchored itself within the subarachnoid space?

Flexner[5] has called attention to the futility of intravenous or other means of medication in cerebrospinal and pneumococcic meningitis and has shown conclusively the value of intra-spinal serum injections in the aforesaid diseases. He draws conclusions from the above infections and as a result recommends the technique of Swift & Ellis,[6] for intra-spinal medication in the treatment of syphilis where the subarachnoid space is involved.

Since the early localization of the disease in the nervous system has been demonstrated as an actual fact, physicians all over the world have been laboring to perfect a method of attacking the disease in this location.

THE STATUS OF SALVARSAN, AFTER FOUR YEARS.

Notwithstanding the fact that numerous deaths have occurred both in this country and abroad following the use of salvarsan, and that special committees have been appointed to pass judgment in regard to its value and toxicity, it still remains the most powerful spirillocide that we possess today. If used with discretion and judgment it is the most valuable single weapon we have in combating the infection, and as for the contra-indications in small doses, not to exceed

0.3 gm. once in seven to ten days, there are none. That the substance is neither harmful to the nervous system or kidneys, has been proven by Doinikow[7] & Wechselman.[8]

Unquestionably the fatalities and complications laid at the door of salvarsan are errors in technique. Briefly and in order of their frequency they are:

1st. Use of water that contains saprophytic bacteria.

2nd. Oxidation of the drug.

3rd. The question of whether the solution is hypotonic or hypertonic.

Considering the wide use of salvarsan it is safe to say that ninety-five out of one hundred doses are given with water that is neither freshly distilled, filtered or sterilized, and as a consequence, toxic effects are common. Few users of salvarsan or neosalvarsan realize that the drug is very unstable and that oxidation occurs rapidly in the latter, according to Ehrlich,[9] three hundred per cent. in one-half hour.

Probably few observers understand that distilled water is capable of dissolving red corpuscles, and with an easy water soluble salvarsan (such as neosalvarsan is) solutions are often made which are capable of doing this in the blood stream after they are injected. This is particularly pointed out by Ravaut[10], who uses concentrafed hypertonic solutions of neosalvarsan in intraspinal injections.

For the sake of *"safety first"* it is demanded that all solutions be made with freshly distilled (not over five hours old) water, properly filtered and sterilized. The drug should not be permitted to stand over five minutes before using and should always be hypertonic.

Methods of Treatment. Owing to the fact that vital stains were the basis of Ehrlich's chemotherapy, and that such stains and salvarsan are allied in their chemotactic properties, and knowing trypan red and trypan blue (vital stains) to be trypanocides, Tilney[11] decided to use these stains on living animal tissue, and especially to observe what happens when intravitam injections were used intraspinally, intravenously, intraarterially and subcutaneously.

Accordingly trypan blue was injected experimentally into a cat by the four ways above mentioned. It was found that when injected intraspinally, the dura mater had stained intensely, the brain diffusely, and the other organs of the body were not stained. Microscopical examinations showed that the trabeculae of the pia mater extending into the cord and brain as well as the walls of the blood vessels were stained. The ganglion cells and nerve fibers were not stained.

Intraarterial injections showed the stain to be confined mostly to the abdominal viscera with no stain in the central nervous system. Injections intravenously showed the dura and pia mater to be involved, but not so intensely as with the intraspinous. The trabeculae extending into the cord were not involved. Subcutaneous injections showed involvement of the abdominal viscera only.

From the foregoing experiment it immediately becomes apparent that we have two ways of combating the infection, once it has localized itself within the subarachnoid space:

1. Intensive salvarsan medication through the blood stream.
2. Intraspinous medication.

Realizing the fact that a large number of all cases which come under observation during the secondary period or later without treatment show spinal fluid involvement, it is pertinent to ask first, what is the most efficient agent; and, secondly, what is the quickest, safest and most effective method of treatment?

Most Efficient Agent. In view of the fact that salvarsan is a spirillocide with negligible organtropic effects capable of entering the spinal fluid, its superiority over mercury is conceded, whether it be given intravenously or intraspinously.

Quickest, Safest and Most Effective Method. Of the two methods of introducing salvarsan into the spinal fluid, the intravenous is the safer, but the intraspinous is the quicker and consequently more effective.

I have classified my cases of spinal involvement into early and late. By early is meant those cases which have involvement without symptoms or detectable degeneration, by late those which show actual nerve involvement together with marked cerebrospinal fluid infection. Of the first class intensive intravenous injections should be first tried before resorting to direct intraspinous medication.

The plan that I have adopted is to give in the early cases, as suggested by Collins,[12] 5 to 7 doses of 0.5 to 0.4 gm. weekly, then rest 3 to 4 weeks, at the end of which time a puncture is made. If this shows a negative serology, the

SPINAL FLUID ANALYSES

		Wassermann Examinations.							Noguchi and Nonne Globulin Tests.							Lymphocyte Counts per Cmm.							Serum Injections with Highest Temperature Reading.							
Name	Blood Wassermann	1st	2nd	3rd	4th	5th	6th	7th	1st	2nd	3rd	4th	5th	6th	7th	1st	2nd	3rd	4th	5th	6th	7th	1st	2nd	3rd	4th	5th	6th	7th	Remarks
H. W.	—	↑	↑	↑	↑	↑	—	↑	—	—	—	↑	↑	↑	—	33	27	11	18	7	5	14	11 C. C. serum and 9 C. C. salt. Highest temp. 100.4.	22 days after 12 C. C. serum & 8 C. C. salt. Highest temp. 99.	32 days after 12 C. C. straight serum. Highest temp. 98.2.	20 days after 18 C. C. straight serum Highest temp. 98.4.	19 days after 5 C. C. straight serum.	29 days after 21 C. C. straight serum.	30 days after 11 C. C. straight serum.	After each injection there were severe pains in legs, lasting 48 hours. Gastric crisis and paresthesia have now disappeared.
F. S.	—	↑	↑	↑	↑	↑	—	↑	—	—	—	↑	↑	↑	—	46	7	11	15	3	28	18	11 C. C. serum and 9 C. C. salt. Highest temp. 101.2.	22 days after 12 C. C. serum & 8 C. C. salt. Highest temp. 99.4.	32 days after 12 C. C. straight serum. Highest temp. 99.	20 days after 18 C. C. straight serum. Highest temp. 99.6.	19 days after 5 C. C. straight serum.	29 days after 10 C. C. straight serum.	30 days after 11 C. C. straight serum.	General constitutional improvement. Improved gait and bladder control. Suffered intensely after each injection. Arsenical poisoning twice.
B. H.	↑	↑	↑	↑	↑	↑	—		—	—	—	↑	↑	—		43	11	5	7	13	16		11 C. C. serum and 9 C. C. salt. Highest temp. 101.	22 days after 12 C. C serum & 8 C. C. salt. Highest temp. 99.4.	32 days after 12 C. C. straight serum. Highest temp. 99.8.	20 days after 16 C. C. straight serum. Highest temp. 99.4.	19 days after 5 C. C. straight serum.	29 days after intravenous "606" only.		General improvement. Romberg possibly less marked. Marked pains in legs after each injection.
B. C.	—	↑	↑	↑	—	↑			—	↑	↑	—	—			5	9	3	3	6			12 C. C. straight serum. Highest temp. 99.	20 days after 18 C. C. straight serum. Highest temp. 99.4.	19 days after 18 C. C. straight serum.	29 days after intravenous 606 only.	30 days after 11 C. C. straight serum.			Insomnia gone. Improved gait and bladder control.
H. R.	—	↑	↑						—							35	35						11 C. C. serum and 9 C. C. salt.	22 days after 12 C. C. serum and 8 C. C. salt.						Left hospital improved and with disappearance of gastric crises.
J. R.	↑	↑							↑							76							11 C. C. serum and 9 C. C. salt.							Left constitutionally improved. Refused to believe he needed further treatment.

treatment is resumed every other week for the same period of time, and later once a month for three months, and still later, every other month. If a negative serology is maintained for a year, all treatment is suspended, but spinal examinations are recommended once every six months.

With an experience of one hundred spinal fluid examinations (to be reported elsewhere), I find that the possibility of eradicating the infection in the early stages by persistent and often repeated salvarsan treatment through the blood stream is possible and that salvarsan so applied often persists and can be actually demonstrated in the blood serum ten days after the last administration where it could not be detected in the urine. The technique of the Abelin[13] test is as follows:

REAGENTS.

1. Resorcin C. P.
2. 20% HCl.
3. 0.5% $NaNO_2$.
4. 30% NaOH.

Technique. Make up a 7.5 per cent. solution of the resorcin in the 30 per cent. NaOH. This can now be kept as a stock solution.

Place ½ cc. of cooled serum in a tube, and add 8 drops of the HCl and then 10 drops of the $NaNO_2$ solution. Mix thoroughly.

In another tube place about 1 cc. of the resorcin solution and then add drop by drop the serum treated with the acid and nitrite solution. In the presence of salvarsan and neosalvarsan or a changed amino derivative a beautiful rose red contact ring appears, most definitely within 1-2 minutes.

Normal serum gives a yellow ring.

2. Intraspinous Medication. A. Injections of salvarsanized serum.

While the time is relatively short to draw any definite conclusion in regard to intraspinous medication, most of us that are familiar with the method, realize the great value that comes from this form of treatment.

Since October, 1913, through the courtesy of Dr. Julius Grinker, I have been treating the following cases of tabes at the Cook County Hospital. A brief report of the serological findings is offered.

CASES. *(See Chart.)*

The technique here used was the Swift & Ellis[10] (supra), but instead of using the serum diluted with salt solution, after the second dose undiluted serum was used in quantities from 15 to 20 cc. at a single injection.

While the foregoing cases, all veritable derelicts of humanity, showed a symptomatic and serological improvement, and while I have nothing but praise to offer for results obtained by the Swift & Ellis technique, unfortunately its application is both tedious and cumbersome.

B. Direct intrapinous injections of neosalvarsan. Realizing the necessity of obtaining a more efficient as well as a more rapid means of medication, I have adopted with slight modifications the method of Ravaut as recommended by Wile.[14]

Technique. The contents of an ampule containing 0.15 grams is dissolved in 5 c.c. of freshly distilled water. Thus each drop will contain 2 mg. of the drug. A spinal puncture is made and 15 c.c. of the fluid are drawn out into a sterile beaker. The mandrin to the needle is then reintroduced, stopping the flow of the fluid. From 2 to 4 drops of the neosalvarsan are now added to the fluid which has been drawn out.

This is now drawn into a Record syringe, the mandrin is then withdrawn, the needle fitted and the solution slowly reinjected.

If any additional quantity of spinal fluid is required for diagnostic purposes, it can be obtained just before the solution is reinjected.

CONCLUSION.

1. The early diagnosis is the most important feature in the management of any case of syphilis.

2. A Wassermann examination on the blood must be supplemented by a complete serological examination of the spinal fluid if we wish complete control of the diagnosis.

3. Salvarsan or neosalvarsan are still the foremost specifics.

4. Intense intravenous medication in all early cases of subarachnoid involvement should first be tried before intraspinous methods are adopted.

5. For the later manifestations, early institution of treatment within the subarachnoid space will certainly arrest the disease and produce a negative serology.

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BONE TRANSPLANTATION INTO THE SPINOUS PROCESSES OF THE VERTEBRAE FOR THE CURE OF TUBERCULOUS SPINE DISEASE, WITH REPORT OF CASES.*

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The transplantation of bone from the crest of the tibia into the split spinous processes of several contiguate vertebrae, as devised by Albee, marks a new epoch in the treatment of tuberculous spine disease. Surgery shows to better advantage here than in tuberculous joints elsewhere in the body; there is no danger of disseminating the infection into contiguous normal bone; no sacrifice of bone to affect shortening, and it is in accordance with orthopedic principles in securing physiological rest thereby affecting the pathologic process.

Let it be understood that I do not favor surgical measures in every case of Pott's disease. The value of any plan of treatment in tuberculous spine disease is estimated by its effectiveness in combating the ultimate deformity. Under conservative treatment recovery may be anticipated in an average period of three or four years, with or without deformity. It is common observation that caries of the middle and upper dorsal region of the spine is very frequently associated with great deformity, whereas caries in the cervical or in the lumbar region, even when extensive, has little or no angular protrusion. Thus, in childhood, routine treatment should be protective, but when conservatism has been tried with disappointing results or in early stages of middle and upper dorsal Pott's disease, surgical intervention is justifiable. In adults, where time plays an important part and quick results are desired, surgical treatment is the method of selection. Quick results, in the exact sense, cannot be obtained in tuberculous spine disease, but in comparison to conservative methods operation, followed by protective treatment, shortens the duration of the disease many months. The early relief afforded patients from discomfort and pain following the operation is striking.

It is needless to state that the Albee operation has no direct curative action on the tuberculous process. The underlying principle is fixation of the vertebrae in order to hold the spine in the extended position so that pressure on the diseased area may be removed, thus producing physiological rest so essential to cure in this disease.

The success of bone transplantation for tuberculous spine disease depends not only upon good surgical technic, but upon the knowledge of the particular vertebrae affected, so that the *graft may be implanted into the spinous processes of all of the diseased vertebrae and at least two contiguous vertebrae on either side.* This effectively splints the spine. A source of failure is the error of implanting the graft into the contiguous vertebrae of one end only, which inefficiently fixes the spine. To obviate this error it is all important that the extent of the diseased area be accurately determined by a good skiagraph before proceeding to operation.

External support (casts) must not be disregarded for many months following the post-operative period of recumbency, inasmuch as too early reliance cannot be placed on the strength of the graft. It is improbable that a firm bony union exists between the graft and the split spinous processes in this period of time. Axhausen has pointed out that the "periosteum and endosteum proliferate and produce callus, which takes part in the formation of union between the ends of the transplant and the bone into which it is transplanted." It has further been pointed out by Dupuytren and Wieder that "there is no permanent callus formation before the eighty-fifth to two hundred and fiftieth day." Particularly in the middle and upper dorsal region of the spine the strain on the graft is greatest because of the extreme liability to deformity in this region. This liability to deformity is the result of the superincumbent weight being

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greatest on the bodies of the vertebrae due to the normal curve being concave in front.

In the cases where the vertebrae were protected by casts for some months immediately following the period of recumbency on the frame, tracings of the spine show no increased kyphos.

This paper is based on nine cases observed in my practice and on my services at Cook County Hospital and the Home for Crippled Children. Seven of the cases were operated upon by me and two by other surgeons. No attempt has been made to gather cases for statistics from other sources.

Case 1. Fay M., aged 13 years. Complained of pain on forward bending for more than one and one-half years before applying for treatment. Slight lateral curvature of the spine was present, but no kyphos. Under thirteen months of conservative treatment by casts and recumbency on a Bradford frame a kyphos in the lumbar region gradually developed and increased in size. April, 1913, Albee operation. Three months later casts applied until November, 1913. Since this time patient has had no protective treatment and is free from discomfort and pain.

Case 2. M. H., aged 3½ years. For nearly two years has had a kyphos of the middle and upper region of the spine. Walked with difficulty for two months previous to applying for treatment. He was placed on a Bradford frame for five months; casts for five months and then because of pain and inability to walk with comfort was again placed on the frame for four months. In the meantime the kyphos gradually increased. July 1913, Albee operation. Six weeks later protective treatment (cast) was applied for a period of three months. Monthly tracings since then show no increased kyphos.

Case 3. Eddie P., aged 19 years. Admitted to my service at Cook County Hospital, August, 1913, because of pain and weakness of the spine. Had a kyphos of the 7, 8, 9, 10 dorsal vertebrae; walked with care and picked up objects from the floor with much difficulty. August 28, 1913, operation. After two months of post-operative recumbency patient was allowed up without protective treatment. Three months later he was discharged from the hospital without symptoms.

Case 4. Joe M., aged 6 years. Treated conservatively for twenty-two months not only for Pott's disease, but for elbow and hip disease; then by Albee's surgical method, April, 1913. Left Cook County Hospital in June and upon his return, August 21, 1913, was admitted to my service. Complained of much difficulty on walking and of a discharging sinus. In the middle dorsal region was a marked kyphos. X-ray showed the graft not implanted into vertebrae contiguate to the diseased ones.

Case 5. George R., aged 5 years. Erroneously treated for hip disease because of pain and flexion of the thigh. Admitted to my service at Home for Destitute Crippled Children because of inability to walk. Had flexion deformity of left limb; discharging sinus in left groin; muscular spasm of the lumbar spine, but no kyphos. Treatment by recumbency for twenty months without materially affecting the profuse discharge. November, 1913, operation. After two months of recumbency was allowed up and walked without protective treatment. Has no discomfort on walking and no kyphos has developed. The sinus still discharges. The skiagraph showed the bone graft fixed well above as well as into the diseased vertebrae, but not below.

Case 6. Tillie C., aged 7 years. Had deformity of middle and upper dorsal region of the spine for two years, which gradually increased; of late experienced shortness of breath and much difficulty in walking. Treated by recumbency on a Bradford frame. November 28, 1913, operation. Two months later allowed up and walked without protective treatment, but after one week a cast was applied because of grunting respiration. Skiagraph showed bone graft implanted into the diseased vertebrae and two contiguous vertebrae above and below. After three months the cast was removed and again reapplied two weeks later because of the grunting respiration. (Evidently the graft has not yet become securely fixed.)

Case 7. Tony S., aged 20 years. Admitted to my service at Cook County Hospital, complaining for several months of pain radiating from the back to the abdomen and to the thighs, particularly the left, which increased on forward bending. Two distinct kyphoses of the spine present. A skiagraph showed destruction of the eleventh and twelfth dorsal and second and third lumbar vertebrae. December 3, 1913, Albee's operation. Recumbent for six weeks and then allowed to be up and around without external support. X-ray showed graft implanted into the vertebrae below, but not above the diseased area. He is without symptoms except a "slight weakness," referred to the abdomen.

Case 8. John D., aged 30 years. Treated conservatively for Pott's disease before being admitted to my service at Cook County Hospital. Complained of weakness and stiffness of the back and had a discharging sinus in lower right lumbar region of the spine. Some deformity present. X-ray showed destruction of eleventh, twelfth dorsal and first lumbar vertebrae. December 15, 1913, operation. Wound became infected and graft removed about one month later.

Case 9. Della P., aged 19 years. Treated at a local hospital by recumbency and plaster casts for two and one-half years for Pott's disease. In the meantime motor and sensory paralysis of the lower

extremities occurred, as well as loss of control of bladder and rectum. Gradually the paralysis disappeared. March 17, 1913, operation. Recumbent for three months and then wore a plaster cast for one and one-half months. For six months was entirely free from all symptoms whatever. Then the right knee began to "jerk" and was unsteady in walking. Admitted to my service at Cook County Hospital January, 1914. Examination: The back showed evidence of a surgical operation. In the middle and lower dorsal region of the spine was a slight kyphos. The patella reflexes and ankle clonus much increased, particularly the right. X-ray showed destruction of the sixth, seventh, eighth, ninth and tenth dorsal vetebrae, also the graft implanted into the diseased vertebrae and into the lower contiguous ones, but not into the upper.

In conclusion I feel warranted in stating that:

1. In children, with caries of the cervical, lower dorsal and lumbar vertebrae, conservative treatment should be the first resort; in middle and upper dorsal Pott's disease or where conservative treatment has been tried with disappointing results, Albee's surgical method is the treatment par excellence.

2. In adults, where time plays an important part and where rapid results are desired, surgical treatment is the method of selection.

3. The value of a good skiagraph of the tuberculous area of the spine cannot be overestimated. A definite knowledge of the extent of the pathologic process should be had before proceeding to operate. Success here depends, primarily, upon the graft being implanted into the spinous processes of all of the diseased vertebrae and at least two contiguous vertebrae above and below them.

4. Too early reliance cannot be placed on the strength of the bone graft. It takes time for the splint to become securely fixed by permanent callus.

5. External support, either casts or braces, must not be disregarded for many months following the operation.

6. Even with continuation of post-operative external support for a period of six to twelve months the duration of treatment is much shorter than the average duration under non-operative treatment.

7. Albee's surgical method incurs no serious risk to the patient. But the operator who has not been particularly trained for this work may expect unpleasant results.

THE SPECIFIC TREATMENT OF HAY-FEVER BY ACTIVE IMMUNIZATION.*

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We define hay fever today as an exudative catarrh of the conjunctival, nasal and tracheobronchial mucous membranes of seasonal periodicity, produced in hypersensitive individuals by the sensitizing and anaphylatoxic action of the pollen of certain plants. The etiology of hay-fever as a true pollen disease was definitely established some fifty years ago by Charles Harrison Blackley of Manchester. He found an able and indefatigable herald for his ideas in Dunbar, who with his pupils, by applying the modern methods of immunology to the problem of pollen disease, gave to it a real scientific foundation on which any future work on hay-fever must be based.

Yet the therapeutic progress in the treatment of this much-maligned disease has not fulfilled the expectations which were held and inspired by the final settlement of the question of etiology. Dunbar's endeavors to produce a passive immunization against hay-fever by means of a horse serum which he believed to contain specific antitoxins against a supposed pollen toxin have brought actually very little change in the helpless attitude of the medical profession against pollen disease, and also in the attitude of the hay fever patients against the helpless medical profession.

The reason for this state of affairs must be ascribed to the tendency of applying too hastily the laws governing the biological and immunological mechanism of living and multiplying microorganisms to the causative agent of pollen disease. The pollen cell holds a unique and singular position. Destined by nature to play the most important part of the plant organism by multiplying the species, it differs from all unicellular microorganisms which cause infectious diseases by lacking completely the faculty of multiplying within the host. It is a formed poison then! Yet a poison proving completely indifferent to the greater part of mankind—though one of the most intense poisons to some. This particular place which we must concede to the

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etiological factor of pollen disease calls for a brief consideration of the problems of pathogenicity, individual susceptibility and immunity before the specific treatment by active immunization shall be discussed.

Pathogenicity, Individual Susceptibility and Immunity. In the month of August all inhabitants of a community inhale onto their conjunctival and nasal mucosæ about the same amount of pollen. The great majority of them remain completely unaffected, while a small proportion become ill with hay-fever. The pollen protein is then a substance harmless and indifferent to the greater part of mankind, but of poisonous character to some persons. These possess a certain individual susceptibility or disposition to hay-fever, while the great majority is immune to the disease. The mechanism of bacterial infection and the laws governing immunity reactions show phenomena of apparent similarity. If the water supply of a community is polluted by a large amount of typhoid bacilli, only a small proportion of the inhabitants become sick with typhoid fever. This fact is interpreted primarily on the ground that the living microorganism does not find favorable conditions for its growth and multiplication in most individuals. We thus relate the individual disposition for the disease to the varying pathogenicity of the invading microorganism. The pathogenicity and virulence of a bacterium is certainly dependent on its ability to grow and multiply within the animal body, but this definition of pathogenicity is incomplete. The colon bacillus grows and multiplies within the animal body and yet it is, usually, a harmless inhabitant of the human intestines. An infectious disease does not alone result from the growth and multiplication of bacteria, but is conditioned by the parenteral digestion of proteins, which as a foreign element are introduced into the blood stream and tissues as a result of the invasion of the bacterial organism. The pathogenicity of a microorganism, therefore, is a function of its ability to grow and multiply within the animal body, and of its activity in leading to the introduction of foreign proteins into the blood and tissue of the same. This definition comprises the great majority of microorganisms, but does not cover completely the few instances where the microorganism, like the tetanus, diphtheria and dysentery bacillus, has the additional faculty of secreting a free toxin.

Pollen cannot grow nor multiply within the host. Its pathogenic action, therefore, must rest either on its faculty of leading to parenteral proteolysis, or on its faculty of producing a free toxin, or on both factors combined; and any endeavor to explain individual susceptibility to hay-fever will first have to consider this mechanism of the pathogenic action of pollen. The analysis of all the possible forms of disposition leads us back to this problem.

Dunbar believes that the pollen contains a true toxin in the sense of Ehrlich and his work in the last ten years has been chiefly devoted to demonstrating the correctness of this view. For upon this assumption rests his specific serumtherapy, the passive immunization with pollantin (pollen antitoxin), which he considers a true antitoxin.

There remains the other possibility of explaining the pathogenicity of the pollen, and this is on the ground that the pollen proteid acts as a sensitizer and as a poison by entering the circulation and tissues of individuals subject to the disease. This conception that hay-fever results from the parenteral digestion of the proteins of pollen has been first suggested by Weichhardt and by Wolff-Eisner. Convincing evidence that the symptoms of pollen disease are called forth by the sensitizing and poisonous (anaphylatoxic) action of the pollen proteid, is brought out by the writer's own experimental work.[1]

It is today absolutely proven by rigid experiments that hay-fever is a disease due to pollen proteid sensitization and anaphylaxis and it is no longer permissible to speak of this established fact as a conception or an hypothesis.

On this basis we comprehend not only the pathogenicity of the pollen proteid and the mechanism of reaction, but also the "peculiar" individual disposition finds a satisfactory explanation. The pollen proteid reaches at some season of the year the nasal mucous membranes of all persons. The human blood and all secretions of the mucous membranes of the body are digestive fluids and have normally very remarkable proteolytic properties. It has been known

[1] Koessler. Journal of Infectious Diseases, 1914, and Koessler, Hayfever in Billings-Forchheimer Therapeusis of internal medicine. Vol. V.

for a long time that the normal nasal secretion shows decidedly bactericidal power; there is no doubt that this is largely due to proteolytic enzymes, whose presence has been experimentally established. This proteolytic enzyme of the nasal secretion in most people splits the pollen like any other foreign proteid gradually down into harmless products, proteoses and amino acids. This cleavage proceeds slowly step by step just as the cleavage of the protein material in the stomach. The poisonous group contained in every protein molecule is therefore, at any one time, present only in small concentration, and since its diffusibility is low, it is rendered inert as cleavage proceeds. The absorption of protein through the nasal mucous membrane is, under normal conditions, exceedingly minute—practically nil. Under various conditions, however, which interfere with the normal digestive function of the nasal mucosa, foreign proteid, e. g., pollen proteid, will be resorbed in sufficient amount to lead to sensitization. Conditions of this kind are: 1, a temporarily insufficient nasal secretion associated with a lowered quantity of normal proteolytic enzyme; 2, stenosis of the nasal canals through hypertrophied turbinates leading to excessive accumulation of inhaled matter and thus to increased resorption; 3, the accidental inhalation of an amount of pollen exceeding the protective function of the exposed mucous surface in the state of temporary nasal achylia mentioned sub 1.[2]

4. A factor certainly only of subordinate importance, which might be considered by some as playing a role in the resorption of protein from the nasal mucosa lies in the active proteolytic power which most unicellular organisms possess, and by means of which they might penetrate into body cells. The pollen grain possesses a special proteolytic enzyme by whose activity the pollen is enabled in the process of fertilization to penetrate the stigma of the ovule. But the resorption of unformed protein, devoid of this fermentation, similar to the resorption of egg albumin by the gastro-intestinal mucosa under similar circumstances, proves that this active proteolytic power of the pollen can well be neglected.

Whichever of the three conditions named above brings about in a special case the resorption of pollen protein by the nasal mucosa, the all important factor is that this first parenteral intake of the foreign protein, through a process not perceived by the individual whose tissue takes it up, has a twofold effect: 1, It injures the epithelial cells of the mucosa and the endothelial cells of the finer capillaries in such a way that the mucosa remains permanently in a state of increased permeability for the protein; and, 2, it brings about a new function of these cells, which consists in the production of a specific protective ferment directed against the specific pollen proteid, the local tissue becomes sensitized.

The primary local sensitization which in a similar way can originate first in the conjunctivæ does not remain localized, and the pollen proteid gradually reaching every tissue of the body with the blood stream, causes all fixed tissue cells, especially those of the endothelial and epithelial systems, to develop this new proteolytic ferment against the pollen proteid. This they pour forth, on renewed stimulation by the specific protein, on the surface of their layer or into the blood stream. However, the cells and tissues first injured and sensitized retain this new specific proteoclastic function with greater persistence and in a higher degree than all other tissues; thus they remain in a sensitized stage and still continue to react when the blood fails to show any proteolytic action in the experiment in vitro.

So profound are these changes induced by the first absorption of the foreign protein that they may continue not only for one year, but for a lifetime, and may be transmitted from mother to child. The hay-fever disposition—the pollen sensitization—can be and often is inherited.

When the same pollen proteid which caused the sensitization reaches again the sensitized cells—in the flowering season of the next or any following year—the sensitized cells of the conjunctival and nasal mucosa pour forth the specific enzyme which readily attacks and dissolves the protein which in the state of solution can be readily absorbed.

The effects and symptoms evoked by this proc-

[2]The protein absorption in the nasal cavity is easily comparable to the gastro-intestinal protein absorption. Normally only a minimal amount of genuine protein passes through the gastro-intestinal mucosa. If, however, the peptic and tryptic fermentation is impaired, e. g., through pancreatectomy, or, if a stenosis is produced by ligating off a part of the intestines, or if an overwhelming amount of protein is introduced, then a sufficient amount of genuine protein passes through the gastro-intestinal wall to be detected in the blood.

ess depend largely on the speed with which the pollen protein is broken up, and thus on the concentration and quantity of the poisonous fraction (anaphylatoxin). The first symptoms are therefore local. The pollen, reaching the mucosa of the conjunctiva, nose, and mouth, is split down and the poison invades the peripheral nerve endings, producing sneezing, itching, and burning in the eyes, nose and palate, followed by vasodilatation, hyperemia and inflammation on more extensive absorption. The increasing intra and extra cellular activity leads to edema and exudation. The nasal respiration becomes impossible and air, and with it the pollen, is inhaled through the mouth. The poison irritates the nerve endings of the palate and larynx, and itching of the palate and a dry laryngeal cough develop and through edema of the eustachian tube often a peculiar tense sensation in the ear. With increasing concentration of the partly dissolved pollen protein, more and more is resorbed into the tissues and blood and then is partly split into its poison. If the protein is set free in the superficial capillaries of the skin, localized areas of inflammation, acute edema with serous exudation will develop—urticaria. The whole organism shows the effects of the protein intoxication; if, preceding the hay-fever attack, 3 hour temperatures have been taken and the normal curve of temperature has been stablished, elevations of 1-2 degrees, alternating with hypotheria to the same extent can be detected (protein fever).

The most dreaded symptom, the hay "asthma" or preferably pollen asthma, deserves special consideration in its relationship to the anaphylatoxic action of the pollen protein. The protein sensitization can account for this symptom in two different ways: 1. The pollen can reach the laryngeal and bronchial mucosa directly by *inhalation* and be split up in loco by the sensitized cells into the poisonous group. 2. The poisonous group reaches the bronchial mucosa and muscles by the way of the *circulation*. The effect is the same. The anaphylatoxin produces diffuse edema, exudation of the mucosa, and spastic contraction of the bronchial muscles, expiratory dyspnea, acute transitory emphysema—asthma.

Thus the individual disposition to hay-fever is to be explained as a *pollen protein sensitization*, which may have been inherited, or, which may have been acquired during any period of life.

Treatment by Active Immunization. The clinical observation that the susceptibility to hay-fever decreases, in some patients, with increasing years suggests that an increased tolerance may be acquired during life through the annual inoculations applied by nature. That this immunization is not accomplished oftener is probably due to the capricious method of these inoculations, which are applied several times a day for many weeks and must lead only to the exhaustion of any protective substances formed. The conception of pollen disease as a protein sensitization primarily localized in certain tissues suggested to us the possibility of establishing this higher tolerance for pollen proteid by increasing the area of sensitization by subcutaneous injection of pollen extracts.

What might be considered the first endeavor to produce an active immunity against hay-fever was reported in 1900 by Holbroc rtis. He used weak extracts of the whole plant (ragweed and goldenrod) in subcutaneous injections and reports favorable results with this treatment. Wagner, Ingals and others have also used various plant extracts for the same purpose and speak favorably of this treatment. Still no mention is made of any continuation of these first trials of active immunization. Dunbar, at the beginning of his researches on hay-fever, had given subcutaneous injections of pollen extracts, using doses which, in the present light of our knowledge, were excessive; being about 100,000 times that which is our average initial dose. He obtained such terrifying results that he did not proceed further along this line of treatment.

In 1911, Noon and Freeman published from Wright's laboratory in London the first scientifically conducted and controlled experiments on active immunization in hay-fever by hypodermic inoculation with pollen vaccine.

Noon injected several patients during fall, winter and spring, with increasing doses of pollen extract of timothy. The interval between the injections varied from 3 to 14 days. The results obtained were controlled by testing the suceptibility of the conjunctiva before and after the injection, and it was found that it decreased markedly as the treatment proceeded. If too large doses were used, the susceptibility was found to increase again, but

soon fell below the value first observed. Noon succeeded in decreasing the susceptibility to 1/100 in most of his patients. Freeman continued the experiments of Noon on the same and on new patients and during the critical season. He treated in all 18 patients. Of these 10 had received the treatment prophylactically during winter and spring —8 after the symptoms of hayfever had developed. He, too, succeeded in reducing the susceptibility of the conjuctiva usually to 1/10; in two cases to 1/1000 of the original value. Three patients obtained an excellent result; 13 were considerably improved; two patients failed to receive any benefit from the treatment.

In the course of a study on the pathogenesis of bronchial asthma and its treatment by bacterial vaccines, which dates back to 1908, I became interested in hay-fever. In May, 1910, unaware of the work done in A. E. Wright's laboratory, I began active immunization against hay-fever and thus far I have treated forty-one patients by this method. Thirty-six of these patients suffered from autumnal catarrh and only five from the spring variety, studied by Noon and Freeman.

A preliminary communication on work along the same line was published last year by George H. Clowes, who reported favorably on the treatment of eight cases.

The Preparation of Pollen Extract. The author's technique employed in obtaining efficient pollen extract consists in the following procedures:

1. *Saline Extract.* One centigramme (.01 gm.) of pollen is broken up as finely as possible in an agate mortar and gradually 10 c.c. of an 8.5 per cent salt solution, ten times as strong as a physiological salt solution is added drop by drop. This saline suspension is shaken for 2 hours and then left in the incubator at 37° for 16 hours. Then the extract is again shaken for 2 hours, centrifuged, and the supernatant fluid separated with a pipette from the undissolved residue. The supernatant fluid which is a dilution of 1/1000, is diluted ten times with sterile distilled water plus 0.25 per cent phenol, which makes the salt solution a physiological one and the dilution 1/100,000. From this dilution all others are prepared. This dilution and all lower ones are unstable and deteriorate by progressive proteolysis into a toxic product within 8 to 10 days. The concentrated pollen solution in 8.5 per cent saline is more stable and on ice can be kept for three weeks.

2. *Alcoholic Extract.* The pollen is first extracted with 8.5 per cent saline solution and the whole procedure carried on as in 1. But the supernatant saline solution after dilution with water to 0.86 per cent NaCl content, is precipitated with ten times its volume of 95 per cent alcohol. The yellowish-white precipitate is filtered off and dried in vacuo to a hard mass. This mass yields a yellowish-white powder, which in a dilution of 1/100,000 produces the typical reaction if instilled into the conjunctiva.

3. We tried further by Vaughan's method (2 per cent NaOH in absolute alcohol) to disrupt the pollen protein in the endeavor to obtain a pollen protein free from poisonous properties. Our experience with this preparation is too limited to be referred to here in more detail.

Experiments showed that all patients subject to autumnal catarrh react most strongly to ragweed pollen extract, and we therefore used this extract exclusively. *The dosage* of the intial dose was determined in the following manner: We first established the minimal toxic dose, determined by the instillation of one drop of pollen extract into the conjunctival sack. This means the highest possible dilution, which in the quantity of one drop (1/20 c.cm), still produces an objectively marked hyperemia. The strength of pollen extract required to bring about this objectively discernible hyperemia varies in different patients. In those who have not been actively immunized before, it lies between 1/20 c.c. of a dilution of 1 in 500,000 and 1/20 c.c. of a dilution of 1 in 10,000; or, expressed in actual quantities of the soluble pollen protein, between 1/10,000,000 to 1/200,000 of one gram. This ophthalmic reaction at the same time serves diagnostic purposes and has been advocated for years by Dunbar. Patients who do not suffer from pollen disease do not give this test even on using ten thousand times the quantity of protein. We tried first to use the intracutaneous test for determining the individual resistance of patients, but we could not obtain satisfactory quantitative results. The susceptibility of the patient, determined by the strength of pollen extract which in the quantity of 1/20 c.cm., i. e., one drop, causes hyperemia of the eye, is the indicator

which determines the initial dose to be used. Noon and Freeman, who proceeded in a similar manner, took as intial dose 1/3 c.cm. of that dilution, one drop, which produced the eye reaction. But the pollen extract of the compositæ especially of ragweed, is far more toxic than that of the framineæ. We therefore use as the initial immunizing dose one-half of the actual quantity of pollen proteid, which gives a characteristic ophthalmic reaction. Thus if a patient reacted to 1/20 of a dilution 1/500,000, which equals 1/10,000,000 gm. soluble pollen protein, we start with a dose which is equal to 1/20,000,000 gram of pollen protein. Under no circumstances, however, do we use an initial dose larger than 1 c.cm. of a dilution 1 in 1,000,000; i. e., 0.000,001 gm. pollen proteid, even if the ophthalmic reaction, according to the above calculation, indicated a stronger dose. For instance, if a patient reacts only to 1/20 c.c. equal to one drop of a dilution 1/10,000; i. e., to 0.000,005 gm. soluble pollen proteid, we do not use 1/2 c.cm. of a dilution 1/200,000, 0.000,025 gm. of pollen protein, which would be one half of the quantity which gives the eye reaction, but we start immunization with the maximum initial dose—which we consider permissible—1 c.cm. of a 1 to 1,000,000 dilution. To facilitate expression and a rapid comparison between the doses used for testing the susceptibility of the patient and the doses used for immunization, we have adopted a unit of pollen toxin. We understand as the unit of pollen toxin the 1/100 part of a millionth of a gram of pollen proteid and designate it as one pollen unit P. U. = 0.000,001 gm., or, written in fraction, 1/100,000,000 gm. Thus, if a patient who is very sensitive to pollen protein gave an objectively marked ophthalmic reaction to one drop = 1/20 c.c. of a solution 1/500,000, we should have in this 1/20 c.c., 1/10,000,000 of one gram of soluble pollen protein; and this resistance would be designated as R = 10 U. P. We should begin his immunization with 1/20,000,000 of a gram of soluble protein, for instance 1 c.cm. of a solution 1/20,000,000, and say the immunizing dose is 5 U. P.

The initial dose is determined in the way described. The subsequent doses, the intervals of time to be observed, and the frequency, depend altogether on the time at which the patient undergoes the treatment. It is most to be desider that the treatment be a prophylactic one, though we have obtained very encouraging results with active immunization if started when the disease was already well developed. Since the first symptoms of autumnal catarrh begin between August 10 and 20, the patients are advised to begin the prophylactic treatment in the first week of May. The resistance is determined by the ophthalmic reaction, and the first immunizing dose (determined as stated) is injected subcutaneously two or three days after the test was made. Only a very small number of patients show any local reaction at the place of injection, consisting in a slight, reddish colored, tumefaction. The next injections are given at intervals of four to ten days, the smaller doses at shorter intervals, the larger one at longer. As far as the strength of the doses is concerned, their increase must be carried out according to the only method to be employed in the active immunization of any disease. This principle, laid down by Koessler and Neuman, in a study on tuberculin treatment some years ago, might be expressed as follows: The increase of doses in active immunization must proceed in such a way that there exists not only an actual increase of dosage, but the difference between the next following and the preceding dose must continually increase or remain the same. But an increase by geometric progression can take place only in the first two or three injections, as this would increase the dosage so rapidly that the patient would respond with very severe reactions. These over-doses not only do not immunize, but they lower the resistance very considerably.

Though the eye reaction is not a safe index for determining the strength of the next dose to be used, it is—if tests are made repeatedly during and after the treatment—an excellent proof that the immunity of the patient against pollen proteid has been actually increased by the injections. In some patients this increase has been several hundredfold and in a few instances even one thousandfold.

Increased resistance of the patient, measured by the ophthalmic reaction, will be noted if the treatment is given not prophylactically, during health, but after the disease has fully developed. The understanding of the mechanism of vaccination during the diseased state is a very difficult

problem, especially in bacterial diseases where it seems unreasonable to add to the milliards of virulent bacteria, a few million dead ones. In hay-fever the invasion of the mucous membrane with pollen leads, as we can show by the complement deviation reaction, to an exhaustion of antibodies in the blood. It is not only possible, but very probable, that these protective ferments have not disappeared suddenly from the blood, but that they have accumulated in the organs and tissues immediately affected. For the resistance of immunized patients tested by the eye reaction at a time when we were unable to demonstrate any antibodies in the blood, did not show any considerable decrease. Such an antibody fixation in vivo is by no means an uncommon thing, but is a far more general biological phenomena than is commonly appreciated. For instance, in echinococcus disease, the demonstration of complement deviating antibodies enabled us in a number of cases to make the correct diagnosis before the operation. There occurred, however, some instances where the test was negative and yet an echinococcus cyst was found. The cyst was removed as a whole, completely intact. A renewed test of the blood after several days was positive and showed a high concentration of antibodies. It is probable that the removal of the antigen disrupted the cell fixation of these protective substances, which, liberated, reach all organs of the organism and could be detected in the blood. So it does not seem absurd in pollen disease that, while the organs and tissues immediately affected are actually saturated with antibodies, other areas and cell territories completely impoverished respond well and rapidly to a renewed injection of the sensitizer with an abundant production of protective substances. The duration of the resistance, increased in such a remarkable degree by active immunization, does not last equally long in all patients. We observed in the fall and winter of 1911-1912, that the susceptibility of patients treated in 1911 rose again rapidly during and after the hay-fever season, as repeated ophthalmic tests proved. But two out of ten patients retained a heightened resistance during the winter. Yet all patients who returned in the following May, 1912, responded with such promptness to the first three injections, that a level of resistance was reached which in the year previous had not been accomplished at all in some patients; or, in others, only after months of treatment. This emphasized the fact that patients must return each season for several years if the treatment by active immunization is to have a permanent influence on their susceptibility until a level of resistance is reached which indicates a safeguard for any further invasion of pollen.

In the last four years I have treated forty-one hay-fever patients by active immunization with pollen extracts. Five of these had the early spring variety of the disease, and all these began treatment after the disease was already developed. The remaining thirty-six had autumnal catarrh. Seventeen of these patients had prophylactic treatment, whereas nineteen were treated while symptoms of hay-fver were present. Four of these patients have been completely free from hay-fever, though remaining in their usual place of abode. Of these four patients, three had treatment during two years, and one during three years—for two to three months. The supreme test in patients who are apparently free from the disease, is a railway or an automobile journey through flowering meadows. Only these four patients of the forty-one could stand this experiment; two of them have so far remained free for two years, and two for one year. Of the other thirty-seven patients, twenty-nine were markedly improved subjectively as well as objectively. The remaining eight must be considered objectively not improved, though five of them feel subjectively benefited. The marked improvement consists in later, milder, and shorter attacks, in the possibility of remaining in town and at work for the first time in years, in a diminution or disappearance of troublesome cough and constitutional symptoms. Twenty-three of the forty-one patients had previous asthmatic attacks during the day and night in the critical season. Of these sixteen experienced an undoubted amelioration of this most distressing feature of the disease. Six of these hay-fever asthmatics had no asthmatic symptoms, though five of them still retained other symptoms of hay-fever. Others had only two or three attacks during the whole season, were little disturbed in their sleep during the night, while all emphasized the improvment experienced.

In conclusion I wish to express emphatically a word of caution. It will not be long before the

commercial manufacturers of vaccines see "the great advantage and benefit" of this treatment. Hay-fever vaccines will be praised and advertised and put up so attractively that their use will become universal and soon—universally discredited. For the pollen extract is not stable, especially not the higher dilutions. By progressing proteolysis, after three to four weeks it acquires marked toxic properties which lead to severe reactions. The solutions must, therefore, be freshly prepared every eight to ten days if these reactions are to be avoided. Whatever the method of active immunization, whatever the dosage and technique, the one sound basis that must underlie all these endeavors is that the material to be injected must be not only sterile, but constantly of uniform potency if used in the same dilution. No extract of pollen can comply with this demand if it is older than three weeks.

104 S. Michigan Avenue.

ABSTRACT OF DISCUSSION.

Dr. Frank Smithies, Chicago: Mr. Chairman and Members of the Society. It is extremely difficult for one to attempt to discuss Dr. Koessler's paper, for two reasons chiefly: In the first place, very few of us have done so much thorough scientific work on investigations in these lines as Dr. Koessler. In the second place, it is only within recent years that the momentous work of anaphylaxis and like subjects has become so standardized as to admit of a uniformity of popularization which enables people to talk in the same language. It is only within the last ten years that it has been shown that such things as asthma, hay-fever, different forms of purpura, joint affections and even, perhaps, such things as angioneurotic edema and different lesions of the gastro-intestinal tract, as ulcer, have been shown to be evidences of local predisposition to a certain type of poison. Whether this is bacterial or not, we are not yet prepared to state. So that in this work it would seem that we have, while not a complete thing, at least an indication, a way out, as it were, in the handling of this extremely interesting type of diseases. Some fifteen years ago, at Ann Arbor Vaughan and his pupils began the investigations of these proteins as such. It was very early shown that we have and must contend with two things: First of all, practically all forms of animal and vegetable matter can be reduced to a common protein radicle; that this common protein molecule contains a poisonous group and a non-poisonous group. In the second place, we had to realize that in the human body this protein could be digested inside the gastro-intestinal canal, viz., *enterically*, and that it could also be digested by ferments or enzymes in the blood serum in no direct connection with the gastro-intestinal tract, viz., parenterally. This interesting observation, which was carried out by Vaughan, Abderhalden, Nicolle, Abt, and others, rapidly showed us that we had possibilities of diseases from the variation of these ferments or these enzymes in the individual blood serum; that this, on further study, was a varying factor; it changed from time to time; a given individual did not always show this presence of active or powerful enzymes. It did not take long then for Vaughan and others to formulate definite chemical (instead of biologic) theories of immunity which appeared to have a basis of fact and not to be entirely lost in terms.

Dr. C. G. Grulee, Chicago: I would like to say that I acted in the capacity of guinea pig to Dr. Koessler for the last two or three years, and I feel that I have been distinctly benefited by the injections. I have had hay-fever rather badly for five or six years, and I know of many other cases treated in his offices where the asthma has entirely disappeared in a few days. In my own case I know that I have had the period of hay-fever materially shortened by the injection. I feel that sometimes a living example is better than a lot of theory.

A BOOSTER SERMON.*

CHARLES W. CARTER, M. D.
CLINTON, ILLINOIS.

We have it on good dictionary authority that a SERMON is a "serious discourse," and that a BOOSTER is "one giving a helpful push." My discourse, I assure you, is serious. I hope it may have a little of the helpful push that we secretaries so often sadly need. I hope, too, that my sermon may satisfy rather better than that of the colored minister who, after delivering his sermon to a congregation before which he appeared as a candidate for pastorship, was waited upon by a committee and informed that his style of preaching was not satisfactory. He was highly indignant. "Why," he said, "What's the matter with my preachin'? Doesn't I 'spoun the Scripters, an' doesn't I sputify the Gospel?" "Yas, Yas," said the committeeman. "Yas, you suttenly does 'spoun the Scriptures, and you shore does sputify the Gospel, an' you 'spouns an' you sputifies, an' you sputifies an' you 'spouns, but you doesn't show wharin."

The secretary of the County Medical Society occupies a peculiar positon in the medical world, and if he continues to be a secretary for very

*Read at the Secretaries' Conference at Decatur, Ill., May 19, 1914.

long he will almost certainly come to hold peculiar views as to medical men and medical organization. If he is fortunately constituted he will develop a certain philosophy to sustain his spirit. But if not so constituted he will be almost as certain to fall into pessimism. I know of no other organization in which the secretary has to fill so large a place, no other in which it is his task to build up and keep alive and spur to action by his own energies and largely on his own initiative the entire organization. It is through his efforts more than of any other officer or member that new members are secured. It is he almost alone who must keep in line the indifferent and wavering, must prompt the careless to pay their dues, must arrange for meetings, plan programs, and write and phone and drum and coax and plead to get out enough members to hold a meeting at the appointed time. This may not apply to the larger societies, but I know it to be true in many of the smaller ones. And it is a tremendous responsibility, and takes time and energy, boundless resourcefulness and endless patience. And thus it is that the secretary who is in earnest and has ideals toward which he is looking for his society finds himself in need of the "helpful push."

The County Medical Society is the most important element in the whole scheme of medical organization. But have you ever stopped to analyze the full meaning of membership in the County Medical Society? And what membership in the County Medical Society has meant in the past and whether it means anything different now? Well, we work according to a bill of particulars known as the Constitution and By-Laws for County Medical Societies, and this scintillating gem from the Olympian heights of the American Medical Association sheds light upon the whole matter in its second article, entitled the "Purpose of the Society," where we learn that "The purposes of this Society shall be to bring into one organization the physicians of Dewitt county, so that by frequent meetings and full and frank interchange of views they may secure such intelligent unity and harmony in every phase of their labor as will elevate and make effective the opinions of the profession in all scientific, legislative, public health, material and social affairs, to the end that the profession may receive that respect and support within its own ranks and from the community to which its honorable history and great achievements entitle it; and with other county societies form the Illinois State Medical Society, and through it, with other state associations, to form and maintain the American Medical Association."

There we have the whole plan of medical salvation in all its alluring beauty. It is as inspiring as an obituary. It fires enthusiasm like an ocean fog. As campaign literature in securing new members it should cause even the bewhiskered quack to forsake the evil of his ways and hasten within the pale.

But to be sure these things do constitute some of the purposes of medical organization. It is eminently true that the intercourse of physicians as members of a County Society does lead to a better understanding the one of the other. It does secure a better harmony and a more intelligent unity and does operate to "elevate and make more effective the opinions of the profession in all scientific, legislative, public health, and material and social affairs." There is pleasure and profit in the reading and discussion of papers in monthly or quarterly meetings. There is valuable deduction to be drawn from the cases reported in these assemblies. Mutual suspicions are disarmed and mutual respect and good fellowship are promoted in the humblest medical organization. But you and I know just how far the appeal of these things is felt in our medical fraternity. You know and I know just how effective they are in drawing men into membership and in keeping them there. Any of these suffices to call together into fraternal union those earnest men who kneel at the shrine of Aesculapius with a sincere devotion, and into whose veins has crept a touch of the sacred fire. Those men, whether ministering to humanity's pain in the populous city or in the humble village, or on the lonely prairie, those are the grand men of medicine. They are the firm pillars of the medical society, and there are enough of these genuinely medical men, thank Heaven, to give us secretaries assurance that medical organization can never utterly perish. But to get hold of and bring into membership and to regenerate, or at least render less harmful, the weak, the indifferent, the unambitious, the sordid, the mere pill peddler for mere profit, that is the sorrowful task that tries the secretary's soul. It is useless

to call the attention of such a man to the lofty purposes set forth in the afore-mentioned section of the constitution. It makes no appeal to him, fires no ambition, awakens no desire. He feels no hunger for fellowship, he doesn't care to hear a paper by some other doctor in the same county. He can stay at home and read in his books what the masters of medicine have to say. He doesn't care to report any of his cases and run the risk of having his diagnosis or his management criticized, or he doesn't want to give away the secrets of his treatment. Or he can't spare the time to attend the meetings, or he doesn't want to subject himself to being bound by rules and regulations and restrictions and limitations, and so so, and so on. And so we resort to more concrete inducements and show him that if he will but become a member, that for a merely nominal membership fee he becomes not only a member of the County Medical Society and privileged to enjoy its fellowship, its dinners, its smokers, its picnics, but without other expense or effort becomes at the same time a member of the State Society and still more, and without further fee or fuss a member of the great American Medical Association, and yet more, eligible, with but another slight fee to become a Fellow in this superlative organization. Moreover he will receive every month the ILLINOIS MEDICAL JOURNAL, a splendid journal, and it truly is a splendid journal, alone well worth the cost of membership. But there is yet the further inducement to come into the society, the medico-legal defense arrangement to take care of his interests and give him a helping hand should he be so unfortunate as to fall into the quagmire of the damage suit.

This is indeed a tempting array of inducements, and helps the secretary no little in bringing in new members and holding together the old ones. A man does his best work, however, when he does it hopefully and with enjoyment and to bring hope and joy into the work of the secretary of the County Medical Society I believe it is necessary to bring to him a larger outlook upon the world of medicine and a more philosophic and perhaps a more idealistic appreciation of the work before him.

I do not sympathize with those who lament the passing of the family doctor as the older generation knew him. There was much that was beautiful and pleasant in that intimate relationship. But his work was small, his outlook limited as compared with that of the physician of today. To the family their doctor represented all there was in medical skill and knowledge, and an able physician might indeed comprehend almost the whole of the then known medical sciences. But a good family practice bounded the horizon of his world.

Today no physician can possibly keep up with the advance in all branches of medical science and very few indeed are interested in medicine only so far as it applies to their own field of practice. The medical man of today ministers to humanity just as tenderly and far more helpfully. But he is living for the relief not alone of the individuals in his limited field or of the families to whom he ministers but his ambition spurs him to work for the relief and improvement of the whole community, the city, the state, the nation. It does not stop short indeed, of the conquest of disease in the interests of all humanity. He is no more a mere healer of the sick. But his highest ambition is to remove the possibility of sickness, whether by the education of the people or the extinction of disease itself. He relentlessly pursues pestilence to its hiding place and no spot escapes him—be it a filthy cesspool, or a dirty city, a pig-pen or a Panama.

And all this upon his own initiative. The physician has voluntarily taken upon himself this labor of teaching the world how to live safely and happily, though constantly threatened with sickness and suffering. No one has imposed this task upon him. It is not his by any coercion, or law, or threat, or even by request, or hardly even by the desire of those who benefit by this invaluable gratuity. To teach man to protect himself from his own follies and from the dangers of a hostile nature is a wholly self-imposed task, assumed by the physician because of his understanding of his fellowman's frailties and of the suffering that his ignorance entails, and because of his sympathy for him when bearing the burden of disease and wretchedness and sorrow—the fruits of his weakness and his ignorance.

We do not need to fear that this task of ours is a thankless one, or that our efforts in behalf of humanity are to go unrewarded. The world is coming to see the value of this conquest for its emancipation from disease. The physician's

work is looming up big in the affairs of men today and I believe he is coming into his own as never before.

Now these things are being brought about through the association of medical men. Medical progress has its root in organization, and finds its stimulus in the inspiration that arises from the getting together of earnest physicians. The efforts of the man who works alone bear no fruit, and his end is in disappointment and pessimism. The man who imagines that he can labor as effectively and as happily out of the society as within it, is simply not in touch with the spirit of the times. A physician out of the society today is out of date. He is an anachronism, a vestigal remnant of another age. If he wants to be in the game and entitled to have a part in the rights and benefits of this golden era of medical achievement he must join with his fellows in the medical society. And it is up to us as secretaries to appreciate the greatness of modern medicine, and to pass along the inspiration to our fellow-physicians until there shall not be one who must be labored with to bring him into membership.

But to render our work most effective we must realize that in this changing time the character of the medical society must change also, and its functions must adapt themselves to the changes in the professional, social and economic life of the medical men of today. Information of the results of medical progress are available to every physician, however remotely located. Books are printed in countless numbers, medical journals are plentiful and easily obtainable. Modern means of transportation and communication promote the more frequent social and professional intercourse of medical men and releases them from the isolation in which many of them once had to live and practice. The medical society of today must, therefore, be something more than an arrangement for bringing physicians together at stated times to read and discuss papers, report cases, and fix up a fee bill. The medical world is doing big things, not for itself but for humanity. The county medical society has its part to play in this great work, and we simply must think bigger things and do bigger things than we have done in the past.

SMALLPOX

Where ignorance is bliss—somebody must pay the fiddler.

In this day and age when so much is said and widely published about the dangers and prevention of smallpox and about milk as a means of conveyance of infection, it seems impossible that there could be any dairyman in an enlightened community so ignorant as to ship milk into a city while he is suffering from smallpox, and, furthermore, while at the height of the disease, to write a letter to the health authorities saying that he was unable to come into the city to confer with them about dirt found in his milk shipments because he had not yet recovered from an attack of smallpox.

But, incredible as it may seem, this very thing happened during the week just closed.

On March 16 the department collected a sample of milk for sediment testing from a can shipped into the city by B——— Bros., dairy farmers near Bass, Ind. The test showed so much gross dirt that notice was served upon B——— Bros. to call at health department headquarters and explain matters.

On March 27 the department received a letter from Henry B———, one of the brothers operating the farm, saying that he could not come into the city in response to the department's notice because he had been ill with smallpox since March 9 and had not yet recovered.

This was the first intimation the department had received of any illness on this farm, and on reference to the files it was found that milk had been coming into this city right along from the smallpox-infected farm. Needless to say, further shipments were stopped immediately on receipt of the letter. How many Chicagoans have consumed this farm's milk or milk with which it may have been mixed we cannot say.

The health department of necessity depends in part on local health officers in the dairying districts to keep it advised of contagious diseases in their respective districts, for, of course, it is impossible to keep all of the 150,000 dairy farms under constant supervision. The health officer of Stark county, Ind., failed to advise this office of the case of smallpox on B——— Bros. farm.

Mr. B——— himself seems to be so ignorant of the dangers of smallpox that he not only shipped milk into Chicago during his illness, but, very courteously, he wrote a letter to the department, probably licked the envelope sealing edge and the stamp with his infected saliva, and then dropped it into the mail box. In the mail this letter must have been handled by many postal clerks and have come in contact with thousands of other pieces of mail delivered in this city.

Those who are properly vaccinated have nothing to fear. Others have.

—From Bulletin Chicago Department of Health.

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AUGUST, 1914.

Editorials

MEETING OF ALIENISTS AND NEUROLOGISTS.

The third annual meeting of Alienists and Neurologists of the United States, held at Hotel La Salle under the auspices of the Chicago Medical Society, has finished its remarkable five-day session, with Dr. L. Harrison Mettler as chairman and Dr. W. T. Mefford, secretary. It was one of the most enthusiastic Medical Conventions we ever attended. It was largely through the untiring efforts of the secretary, that the program of some sixty-nine papers was assembled. These valuable contributions were read by representative men from seventeen states and over thirty official representatives from various states were in attendance, appointed by the governors of their respective states.

The sessions were marked by large attendances of both physicians and laymen, and intense interest, as witnessed by daily local press reports of a column or more. Through the Associated Press also wide publication was given the scientific discussion and committee reports. The entire proceedings will be published in one volume by the ILLINOIS MEDICAL JOURNAL, and this book will be of immense value for future reference, covering, as it does, so wide a range of subjects bearing upon insanity in its several phases, epilepsy, mental deficiency in relation to eye disorders, adenoids, heredity and other causes, syphilis, alcoholism, pellagra, the Abderhalden test for dementia preacox and the technique of preparing the materials for making the test and many other kindred subjects.

The result of these annual sessions will go far to epitomize and condense our knowledge of problems, the solution of which involves the health, happiness and stability of our people and by the popular character of the meetings, the public will be educated. It is only by an understanding of the causes, the needs and the methods of prevention, and the thorough co-operations of profession and public that adequate legislation can be obtained to control the situation.

Subjoined are four sets of resolutions formulated by special committees and passed unanimously.

A committee will be appointed to place the resolutions before the respective governors of the States, and to call to the attention of the legislatures of these states the defects in their present laws, and it is hoped that a uniform law or plan may eventually be adopted regulating the lives of our mental defectives, the spread of syphilis, or better still controlling it, alcoholism, and if possible get enacted better marriage laws. Following are the several resolutions discussed and adopted by the convention.

RESOLUTIONS PASSED BY THE ALIENISTS AND NEUROLOGISTS.

ALCOHOLISM.

Chicago, Illinois, July 14, 1914.

WHEREAS, In the opinion of the meeting of Alienists and Neurologists of the United States in convention assembled, it has been definitely established that alcohol when taken into the system acts as a definite poison to the brain and other tissues; and

WHEREAS, The effects of this poison are directly or indirectly responsible for a large proportion of the insane, epileptic, feeble-minded and other forms of mental, moral and physical degeneracy; and

WHEREAS, The laws of many states make alco-

hol freely available for drinking purposes; and, therefore, cater to the physical, mental and moral degradation of the people; and

WHEREAS, Many hospitals for the insane and other public institutions are now compelled to admit and care for a multitude of inebriates; and

WHEREAS, Many states have alreay established separate colonies for the treatment and re-education of such inebriates with great benefit to the individuals and to the commonwealths; therefore be it

Resolved, That we, unqualifiedly, condemn the use of alcoholic beverages and recommend that the various state legislatures take steps to eliminate such use; and be it further

Resolved, That we recommend the general establishment by all states and territories of special colonies or hospitals for the care of inebriates; and

Resolved, That organized medicines should initiate and carry on a systematic persistent propaganda for the education of the public regarding the deliterious effects of alcohol; and be it further

Resolved, That the medical profession should take the lead in securing adequate legislation to the ends herein specified.

Respectfuly submitted,

Committee on Alcoholism as a Positive Factor of Insanity.

Chas. F. Read, Chairman, Chicago.
Arthur M. Corwin, Secretary, Chicago.
W. S. Lindsay, Topeka.
T. B. Throckmorton, Des Moines.
Theo. A. Diller, Pittsburgh.

LEGISLATION.

We feel it unwise at this time to make any recommendations in regard to constructive legislation, owing to the lack of proper evaluation of available data as to causes and sources of mental deficiency.

We do, however, recommend and urge regulation of mental deficients and the furthering of investigations as to the causes and sources.

(Signed):

Dr. W. S. Lindsay,
Dr. Carl W. Sawyer,
Dr. J. J. Mendelsohn,
Dr. George S. Bliss,
Dr. E. B. McCready,
Dr. A. C. Rogers,
Dr. Thomas H. Leonard,
And others.

Committee on the Causes and Forces of Mental Deficiency.

SYPHILIS

WHEREAS, Syphilis is responsible for a large percentage of all insanity and mental deficiency; be it

Resolved, That:—

1—Health Departments, (Municipal and State), should be equipped to make laboratory examinations for Venereal Diseases.

2—All Hospitals for the Insane should be equipped to make laboratory examinations for Venereal Diseases.

3—Hospitals and Dispensaries for the treatment of Venereal Diseases, should be provided.

4—Physicians should be compelled by law to report cases of Venereal Diseases, as is now done in other contagious diseases.

5—Applicants for marriage should be required to furnish health certificates.

6—Lectures and Bulletins should be offered freely to the public regarding Venereal Diseases.

7—Newspapers should be requested to use their best influence to educate the people concerning Venereal Diseases.

8—Sex Hygiene should be taught in the Public Schools, above grammar grades, to the sexes separately. (Signed):

Dr. W. A. Evans, Chairman, Chicago.
Dr. Henry A. Cotton, Trenton, N. J.
Dr. B. F. Williams, Lincoln, Neb.
Dr. F. L. Peddicord, Lakeland, Ky.
Dr. H. A. Lindsay, Independence, Ia.
Dr. Edward F. Leonard, Secretary, Chicago.
Dr. G. A. McCaskey, Ft. Wayne, Ind.
Dr. Albert E. Sterns, Indianapolis, Ind.
Dr. S. N. Clark, Hospital, Ill.
Dr. H. I. Davis, Chicago, Ill.

Committee on Syphilis as a Causative Factor of Insanity.

PREVENTION OF INSANITY.

WHEREAS, It is well recognized by alienists and neurologists the world over that certain major factors are the chief causes of physical

conditions, accompanied by mental derangement and deficiency; and

WHEREAS, These major causes are very largely, if not wholly, controllable and eradicable; and

WHEREAS, These major causes are alcoholism, habit producing drugs, venereal diseases, work in unsanitary and unhygenic surroundings, and hereditary influences including the immigration of the physical and mental unfit, therefore, be it

RESOLVED, First, that we recommend to the proper state authorities the absolute control of the sale of alcohol until such time as actual prohibition be enacted; second, that the sale of all habit-producing drugs be strictly regulated in all states of the Union; third, that municipal or state control of venereal diseases be established, with proper treatment for indigent patients, to the end that the spread of syphilis and gonorrhœa be prevented; fourth, that proper, special hospitals for the care and treatment of alcoholism and drug addictions be established; fifth, that municipal, state and national inspection of labor conditions be regularly maintained and child labor abolished; sixth, that the various states pass reasonable and universal marriage laws, that will be reciprocal, in preventing the marriage of the physical and mental unfit; seventh that no known mental defective dangerous to himself and to others, should be permitted to have unrestricted liberty; eighth that adequate teaching of the principles of heredity and sex life be initiated and fostered in the home with the view to its introduction into the curricula of schools—above the grammar grades, this instruction to be given to the sexes separately; ninth, a psychopathic laboratory should be connected with the criminal courts, common schools and all public service and transportation companies and that all employes of said service utilities and transportation companies responsible for the actual safety of the general community, should be regularly examined as to their physical and mental fitness; tenth, that, in addition to the above, we recommend a nation-wide campaign of education conducted through the public press, university and medical schools, boards of health, state, county and city boards of education, women's clubs and any other proper educational mediums, upon the true significance of the development—physical, mental and moral—of the individual and the race, and finally, we recommend that a committee be appointed to promote the enactment of the above resolutions.

The Resolutions were signed by the following of the commitee on Prevention of Insanity.

Dr. J. Cheston King, Chairman, Atlanta, Ga.
Dr. Julius Grinker, Secretary, Chicago.
Dr. Albert E. Sterne, Indianapolis, Ind.
Dr. C. F. Neu, Indianapolis, Ind.
Dr. Henry S. Monroe, Omaha, Neb.
Dr. H. J. Gahagen, Elgin, Ill.
Dr. John A. Lewis, Reno, Nev.

The Other Members of the Committee were:

Dr. H. N. Voldeng, Cherokee, Ia.
Dr. L. Biggs, Fulton, Mo.
Dr. Chas. Ricksher, Lake Geneva, Wis.
Dr. Rock Sleyster, Waupun, Wis.
Dr. J. T. Searcy, Tuscaloosa, Ala.
Dr. C. E. Sawyer, Marion, O.
Dr. Theo. Diller, Pittsburgh, Pa.
Dr. T. B. Throckmorton, Des Moines, Ia.
Dr. Sidney I. Wilfus, Rockford, Ill.
Dr. A. L. Ludwick, Kansas City, Mo.

DR. COOLEY A CANDIDATE FOR CONGRESSIONAL HONORS.

Dr. E. B. Cooley of Danville is a candidate from the 18th Congressional District for a seat in our national house of representatives.

Dr. Cooley has served the State Medical Society as councilor of the 8th councilor district for over six years and was re-elected to that position at the last annual meeting.

While Dr. Cooley's friends were circulating his petition the Danville doctors paid him a flattering compliment by presenting him with a standard size petition filled with the signatures of 25 of Danville's Republican physicians. The others could not sign his petition, but are with him just the same.

As is usual in such cases the machine publications are out against him. Up to this time the only argument they have produced as to why he should not be elected is that he is a doctor, and that he is educated. These we take it, are, in the mind of these same publishers—adequate reasons why the doctor should be defeated. It is quite possible that the political mind of the newspaper editor grasps the idea that a man who has been so near the people, a man who

has so long looked to both the physical and material welfare of his constituents—and a man who so well knows the needs of his community could not easily be used in political chicanery.

We do not need to state that the medical profession is not represented in our legislative bodies. The fact is only too patent that the medical profession is very frequently badly misrepresented. A duty that every physician in the 18th district owes to the medical profession is to support Dr. Cooley in his candidacy. If every physician in the district will work for the election of the doctor there can be but one result, and that is Dr. Cooley's election—and it would also show that medical organizations may be made effective.

There is not a doctor in any congressional district who can not persuade many of his clientele to vote for a high grade man for a legislative position. The people want men of brains and men of honest principle to fill these high offices. If every doctor in the 18th district will each secure the votes of 15 of his patrons, the victory—not for Dr. Cooley alone, but for the commonwealth and for the medical profession, is won.

TUBERCULOSIS NOTES.

Prof. Sablis method of tuberculin treatment:

Begin by a minute injection of a very dilute solution of tuberculin.

Repeat each dose of tuberculin at least 5 times in afebrile cases in good general condition, and 10 times or more in febrile cases, in order to judge accurately of the stimulating effect of the dose on the defensive mechanism of the body.

Thereafter increase the preceding dose by ½° only. When the optinum dose shows itself by a favorable therapeutic action, however slight, keep to that dose as long as its favorable action permits.

Avoid reactions in treating as you would rattle snakes.

Tuberculin must be used if at all as soon as diagnosis is made, and not wait until all other modes of treatment have failed. It is a remedy for early non-progressive tuberculosis and results cannot be expected (but do sometimes occur) in advancing cases.

High frequency treatment recommended by Dr. H. Van Rensselar.

Friedman's remedy is still being given space in journals. How long will it take to be forgotten?

Nascent iodin is strongly recommended in treatment of tuberculosis K. I. gr. 20 in A. M. Chlorin water oz. 1. tid.

Dropping tuberculin on skin from 1.25 dilution to pure tuberculin and rubbing it in until it has disappeared recommended by Kutschera. Used once a week and doses gradually increased in strength. To be continued two years after last manifestation has disappeared. F. J. F.

SPEAKING OF INFANT WELFARE.

Several "high class experts" are reported to have testified at Washington recently in behalf of dealers in dirty milk that they would not consider milk "filthy" unless there was enough manure in it to "give it a brownish color or an odor."

Do you think these gentlemen would get many votes from the mothers in Chicago?

A baby saved is a blessing earned.

Saving a baby costs the public so little; losing a baby costs a mother so much.

DIRT IS

Disgusting
disfiguring
devitalizing
-e-a-d-l-y

The dirt rate of a city is a big factor in determining its death rate.

A vigorous anti-dirt campaign would do Chicago more good than any other kind of an "anti" campaign of which we are able to conceive—more good morally, physically, healthfully and eventually with respect to its reputation.

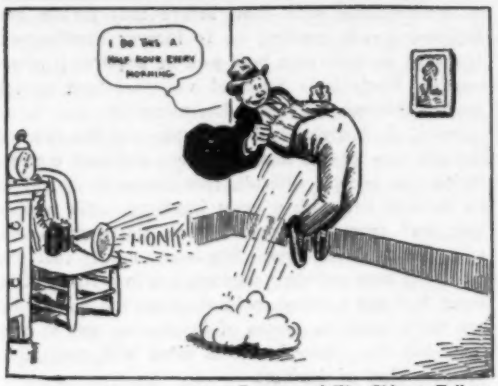
In his address of greeting to the International Congress on the Welfare of the Child, at Raleigh, N. C., in April of this year, Secretary of State Bryan speaking of child welfare work and the appeal it makes to every good heart, said:

"The child is the creature of its environment. It comes into the world without its volition. It has no way of shaping the conditions that surround it. It must be acted on by forces that it neither selects nor can control. Therefore, as the child is the most helpless thing in the world it is the thing that most needs the consideration of others."

Commenting further, Mr. Bryan emphasized the fact that child welfare work returned to society benefits far out of proportion to the amount that is expended. "We are learning," he said, "that it is much cheaper to keep a child from going wrong than it is to bring it back and to recompense society for the injury that it has done. There is therefore no money that is more wisely spent than that which is spent in the care of the child."

Auto Sparks and Kicks

WHY NOT TRAIN PEDESTRIANS?



Courtesy of The Chicago Tribune

PEROXIDE IN GASOLINE

According to an item in *Motor Age,* a new use has been found for hydrogen peroxide, a chemical which heretofore has been considered to have its principal value in the manufacture of blondes. To George B. Celden is due the credit for the discovery. His latest contribution is the fact that if kerosene is treated with peroxide of hydrogen, it burns freely and completely in the cylinders, causing no smoke or smell in the exhaust, and forming no deposit. Further, that ordinary carbureters can be used, if they give a sufficiently wide range of air adjustment, and exhaust gas can be used for heating them. As the incomplete combination of the raw kerosene, with the attendant carbonization and smoking has been the chief obstacle in using the cheaper fuel in gasoline engines, this development may give kerosene a much wider use. As to the cost of the treatment, it is stated that this is little more than the labor of handling.

Theoretically, the complete combustion of fuels as a result of treatment with peroxide of hydrogen is to be expected, for when it is decomposed by heat it gives off quantities of oxygen which unite with the fuel proper.

CAMPHOR AS VITALIZING AGENT

Abroad, where great pride—and just pride—is taken in the mileage per gallon of fuel that can be obtained, a small band of motorists recently has been experimenting with gum camphor as a "dope" for gasoline. Usually about one ounce of camphor is placed in five gallons of gasoline and it is stated by those who use the mixture that the operation of their motors is much better with the camphor in the gasoline than without it. One motorist even goes so far as to claim that he has been able to increase his mileage per gallon as much as 20 per cent, though it would seem that the increase cannot be due to the use of the camphor alone. The idea is not new, of course, for Curtiss, at present of aeroplane fame, used it a number of years ago in his racing motorcycles and it is said he sometimes uses it now in his aeroplane engines.—*Scientific American.*

A GLYCERINE SOLUTION FOR SUMMER RUNNING.

Taking a lesson from the steam boiler, many motorists have adopted with success the practice of using a small amount of glycerine in their cooling water, not as an anti-freezing mixture, but as a scale preventive. The glycerine in the radiator has a tendency to eliminate the formation of a scale. A proportion of one-half pint to each five gallons of water is sufficient for this purpose.

TO AVOID BREAKING AN ARM.

Many a broken arm and worse would have happened had not the following advice of George A. Hows, the founder of the famous Panhard oil business been followed: When cranking, place the thumb against the index finger and take the handle between the four fingers and the palm of the hand. The hand thus opens readily should a back-kick occur. Always crank up, never down. —*Motor Print,* July, 1913.

The teacher said, "Vast swarms of flies descended on the land and came into the houses of the Egyptians and covered their clothing and their tables and all their food, but there were no flies on the children of Israel."

Small boy, "Please ma'am, there ain't none now, either."

"Did you drink the water very hot an hour before each meal as I prescribed," the doctor asked, "and how do you feel now?"

"I tried hard," the patient wailed, "but I had to stop too soon. I drank for 35 minutes and it made me feel like a balloon."

Society Proceedings

COOK COUNTY.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular meeting held December 16, 1913, with Dr. George W. Boot in the chair.

LIP-READING FOR THE ADULT DEAF.

Miss Gertrude Torrey of Chicago read a paper.

Abstract: Some people find lip-reading hard to learn; others find it comparatively easy. This is due to a difference in the type of mind. Teaching lip-reading becomes a psychological problem. The theory and basis of lip-reading can be mastered in three or four months. Sometimes one becomes a fairly good lip-reader in that time, but usually the first three months should be followed by from six months to a year or more of very thorough practice. A good lip-reader can almost entirely overcome the handicap of deafness.

Every vowel and consonant has its own movement. Each movement is studied and then applied in words, in sentences, in stories, vowel exercises and consonant exercises are used, conversation practice, etc. The psychological side is developed.

Successful lip-reading depends upon the *application* of the principles. The most important point is a great deal of intelligent practice.

Miss Torrey gave a demonstration of two pupils, one entirely deaf, one very deaf, who carried on an impromptu conversation on various topics with her. They also talked with some of the physicians and one spoke German with Dr. Beck, though all instruction in lip-reading had been in English.

DISCUSSION.

Miss Mary McCowen thinks that Chicago is fortunate in having Miss Torrey, because there are a great many people in Chicago suffering with partial deafness, more than can be taken care of by the teachers who give their time principally to teaching of deaf children. There are in operation in the night schools of the city of Chicago classes for adults who are becoming deaf. Such classes are maintained on the south and north sides. But in these schools it is impossible to take care of all the people who wish instruction, because there are not enough teachers properly trained. The speaker's work has been very largely with little children. Speech reading is used, but it is purely incidental in the case of children. The first thing is to give these children an education, and speech is used as a medium of communication. With the adult speech reading is, of course, a translation. It is learning another language. As Miss Torrey said, it is a language of movement, but the speaker would add that the movement is limited by the eyes.

Another point with reference to the speech reading of adults: It is a tremendous advantage for a person who is partially deaf to begin to get speech reading before he or she is acknowledged to be very deaf, for his or her own sake, and also for the sake of others. If the community reaches the conclusion that a person is deaf and that it is difficult to communicate with him, before that person had acquired speech reading, he is forever handicapped. It makes no difference how well he acquires it afterwards. Many have acquired very excellent speech reading through their own determination.

Dr. E. L. Kenyon said that when one has reached the point in loss of hearing where ordinary conversation has become difficult, that person is bound to go through life with a great handicap. His mother was deaf from the time she was thirty years old, following typhoid fever. She was so deaf that she could not hear ordinary conversation in a room. She never had any training in lip-reading—the doctor did not know what the status of lip-reading was at that time—but the speaker's life is filled with realization of the pathos of deafness.

Of course, when an adult becomes deaf, he does not necessarily become totally deaf, as we all know. The point which he wishes to emphasize was that one should conserve every bit of hearing that can possibly be conserved. One should not only cultivate lip-reading in those that are deaf, but still have hearing, but he should cultivate increased capability of hearing for words. He would take up Miss McCowen's thought, that lip-reading should be begun early, before hearing has been lost, and go further: He would say that training of the ear should be begun the moment, or as soon as possible after, the individual knows that he is to become deaf. We hear largely by hearing key sounds, particularly if we hear badly. These key sounds are sounds which give us a cue as to what the rest of the word is. So his contention would be that we should educate the hearing of these people by analyzing the words phonetically for them, with the idea of giving them an appreciation of the individual sounds in those words, so that they could better interpret the complete word from the part heard.

Possibly something could be done by this organization to inaugurate a movement for the education of the public in the matters of prevention and amelioration of deafness. How many people, for example, are acquainted with the value of lip-reading to the adult deaf? Or how many are familiar with the importance of early teaching of lip-reading to the child who has become deaf? Or how many appreciate the necessity of early treatment of pathological conditions affecting the ears? Such a social work of education is being done for the eye and should be done also for the ear.

Dr. Joseph C. Beck said that we are having less deafness than formerly, which he believes is due to the fact that we recognize the etiological factors producing deafness. Of course, this does not refer to cases of congenital deafness, but to cases of acquired deafness.

As long ago as last year, in discussion at the state

meeting, the speaker voiced an opinion against this attempt to teach the hard-hearing individuals lip-reading and he thought, as Dr. Kenyon mentioned, to stimulate the hard-hearing people to try and hear without watching the lips and so stimulate the auditory nerve and the acoustic apparatus, so that it would be kept in action. He always remembered this lesson from Professor Zaufal, who insisted on that. But he believes now and is willing to be convinced that the mistake is perhaps made too often the other way in waiting too long. Especially is this the case in otosclerotic individuals, and he has now under observation several patients of this form who are being instructed in lip-reading.

Of course, some people learn lip-reading readily, as he would show by the demonstration of a case, but others find it very difficult. For instance, he has a patient, thirteen years of age, who is practically deaf, but who does not respond the least bit to lip-reading.

Something might also be said on the side of the question that many people run their words together in speaking, or there is not much lip action, or people do not accentuate clearly, and so that is a difficulty in understanding them, especially for hard-hearing people.

Presentation of patient: Young woman, twenty-four years old. Diagnosis, otosclerosis. Practically deaf for seven years and hard hearing since eight years of age. This young woman is a perfect lip-reader and never has had a singel lesson. The hearing test in this case shows that only the loudest whistles can be heard. (Demonstration of patient reading the lips of various individuals.)

Dr. J. R. Fletcher asked Dr. Kenyon, since he had had experience with deafness in his family, what he considered the relative catastrophe between deafness and blindness.

Dr. Kenyon said he did not know that he had an intelligent answer for this question, but that Miss McCowen might have. He has never analyzed it carefully enough to know. It might be somewhat temperamental with the individual and also depend somewhat upon the life conditions of the individual. On the whole, he is inclined to think that deafness is a more serious affliction than blindness. There is something so essential to human contentment that people should be able to carry on quick thought with those about them.

Dr. J. R. Fletcher mentioned this because a gentleman voluntarily said to him the other day that it seemed to him deaf people are far worse off than the blind. This man said he had lived with two uncles, one deaf and the other blind. The blind man was one of the happiest men and the sweetest of natures. The deaf uncle was mean, morose, melancholy and suspicious, and generally disagreeable, and life was not worth while. This man said that he would choose blindness, if necessary, of the two afflictions.

Dr. Otis H. Maclay had been very much pleased with Miss Torrey's paper and the discussion and believed all the members would join with him in this expression of appreciation.

There is one point otologists should consider, namely, that when patients are not being helped they should be advised to learn lip-reading. It would be only fair to them as well as to the profession as a whole.

A future meeting of the society might be arranged where we could follow out some of the ideas brought out at this one.

Dr. J. Holinger asked what is the pathology of these cases? Most frequently they are otosclerosis, starting at the age of sixteen, eighteen or twenty. As soon as we notice that the patient is going beyond the usual degree of hard hearing, where he cannot very well understand conversation, then he is certainly a subject for lip-reading. Hearing exercises are of no value.

In labyrinth deafness after infectious diseases, scarlet fever and typhoid fever, etc., the deafness is from the start of such a degree that lip-reading is absolutely necessary.

In hard hearing caused by chronic suppuration of the middle ear the danger to the life of the patient is often more important than the function of the ear.

Miss Torrey, in closing the discussion, referred to the thought suggested by Dr. Beck, on the possibility of lip-readers not trying to hear. As a rule, a person who is deaf and who is *not* a lip-reader does not try to hear unless addressed personally. He thinks it is too hard, or useless, and he is apt to become engrossed in his own thoughts. This fact is admitted by many who are deaf. Successful lip-reading calls for absolute concentration and for great mental alertness which reacts upon all the senses, making them more sensitive to the impressions they receive. A good lip-reader sees more and feels more than the average "normal" and probably hears more than a nonlip-reader of the same degree of deafness. For the mind is ready to respond to anything that will help in understanding, no matter through which sense the help comes. And for this reason it seems probable that the ear is used fully as much as in the case of a nonlip-reader.

DISEASES OF THE ANTRUM.

Dr. Truman W. Brophy of Chicago presented a paper:

Abstract: Ninety-seven per cent of all people have diseases of the teeth. The teeth, therefore, are more subject to diseases than any other tissue of the body. The physician should have some knowledge of the symptoms produced by diseased teeth. It is through this lack of knowledge that many operations about the face are failures. The making of external incisions through the face based upon an erroneous diagnosis is an unwarranted procedure, yet it is of common occurrence.

The anatomy of the antrum was then taken up in detail. Following this, the author opened a discussion

upon empyema of the antrum. When we realize that the apices of tooth roots often penetrate the antrum, it is easy to understand why empyema of the antrum so frequently follows the formation of dento-alveolar abscesses and other infections of dental origin. A tooth with a dead pericementum is like a piece of necrotic bone; it should be taken away. Suppurative dento-alveolitis unquestionably may be the cause of empyema of the antrum. This is frequently overlooked. Empyema of the antrum may also follow rhinitis, infection of the frontal or accessory sinuses, foreign bodies in the antrum and diseases of the nasal tract. It also comes as a result of careless handling after removing a tooth. The antrum may be punctured by the examiner and infected material forced into it. Fully seventy-five per cent of the cases are the result of some dental lesion. The surgeon should use every means at his command to determine the vitality of the teeth in empyema of the antrum.

The symptoms of empyema of the antrum followed this discussion. In the diagnosis of this condition it is not necessary to open the antrum through the nose, as a small opening may be made in the canine fossa and the cavity flushed out by inserting a syringe. The dental engine may be used here advantageously. Transillumination and x-ray pictures should be brought into service. It is essential to examine all the teeth.

In the treatment of empyema of the antrum it is necessary that thorough drainage be established and that polypi, diseased teeth and bone and foreign substances be removed. The removal of a sound or diseased tooth for such a purpose is not warranted, except where the tooth is not firm in its socket. Although diseased teeth may have been the primary cause of the condition, they are often amenable to successful treatment. The importance of the function of the teeth demands that they should be cured, if possible, and restored to usefulness. The various operations for the cure of empyema of the antrum were then discussed. Regarding the openings made into the antrum through the nose the author stated: "Nature created an aperture of communication, the ostium maxillare, between the nose and the antrum. It is the surgeon's duty, in case this opening has been closed by adhesions as the result of inflammation, to open it and re-establish its function, instead of making a large unnatural opening at the base of the nose through which dust and mucus may enter the antrum, thus becoming a constant irritant and making the permanent cure of the disease impossible."

Any operation for the treatment of chronic empyema of the antrum which does not admit of an ocular examination of the antral walls is extremely faulty. In nearly all cases of chronic empyema, polypi are seen. It is their presence which explains the failure of cure in so many cases treated through small openings. To treat the antrum in such a manner as will give the surgeon a complete understanding of the exact condition of the part, a large opening through the canine fossa should be made. After the patient is anesthetized, the lip is reflected upward and an incision is made one and a half inches in length directly above the cuspid tooth root. Another incision is made downward a half inch above the first one, and the periosteum elevated so as to leave a considerable area of bone exposed. The cavity is then punctured by means of the dental engine and a bur. A button-shaped piece of bone is removed and the finger introduced. Polypi are curetted and foreign bodies removed. The mucous membrane in the walls, if possible, is not disturbed. The antrum is then dried with sponges and the cavity packed with sterile gauze. The gauze is changed every other day for ten days, when an antral plug is made and placed in the opening. This is kept in until the walls of the antrum are normal, which is determined by illuminating.

DISCUSSION.

Dr. C. M. Robertson said there are some points about diseases of the antrum that Dr. Brophy did not mention, and which the speaker thinks are not generally understood. One is that antrum diseases are sometimes caused by posterior ethmoiditis and sphenoid abscess. He noticed in some of the pictures that the laminæ that were present in some of the antra were more complete than in others. This was due to the formation of the antrum in early life, in which the ethmoidal cells pushed down. Those are ethmoidal cells; they are not part of the antrum. Those are the inferior cells of the ethmoid, just as we have the superior cells going over the orbit and the cells that go down into the middle turbinate, the middle cells. This condition Dr. Robertson has noticed very frequently in the cadaver.

Regarding the etiology, of course, the dentist requires that everything comes from the teeth, so that Dr. Brophy says that seventy-five per cent of the cases occur from dental origin. We will in turn give him twenty-five per cent and say seventy-five per cent occur from nasal origin. We will have to admit, however, that most of the cases show a caries in the molar teeth.

We have cases of non-suppurative inflammations of these sinuses. The first man to discuss and write about this was from the middle part of New York state and the speaker believes that he was the next one. Then Dr. Brawley of Chicago reported on a number of cases with all the subjective without the objective symptoms of empyema.

One of the most common symptoms that we have to treat in connection with antral diseases is the condition that occurs in the respiratory tract further down, resulting in asthma, bronchitis and the reflexes that occur from the pus in the nose. The objective sign—pus in the antrum—does not mean anything; we can have it from so many causes.

Walter's negative pressure apparatus the speaker had never heard about before, but he had heard of

other negative pressures, and it is hard to imagine a better negative pressure than the Brawley pump, or the pump of Dr. Pynchon.

Puncture through the canine fossa has always been objectionable to Dr. Robertson on account of, first, infection that occurs in the mouth from the nose, and, second, in the antrum from the mouth. The antrum is a nasal accessory sinus and it seemed to the speaker that drainage should be made in the place where nature intended it to be. We do not recognize the alveolar process as a place for draining. Neither does Dr. Brophy. Dr. Brophy's canine fossa, or the Caldwell-Luc route, is a more direct and better one than the alveolar. But the antral wall of the inferior meatus, in the speaker's opinion, is the selective point. He read a paper on radical operation on the antrum about five or six years ago before the North Side Medical Society and it was at that time criticised. It was said that it was impossible to do what he said he could do. He has demonstrated time and time again that he can operate upon the antrum of Highmore and cut away the entire inferior wall—that is, the wall in the inferior meatus, and save the entire inferior turbinate body, so that anybody looking into that nose could not tell that the antrum had been opened, and at the same time the antrum has an opening of the entire extent of the inferior meatus. This, to his mind, is a better operation than the Denker or the Caldwell-Luc, or the operation of Dr. Canfield, and it is very easy of accomplishment. The operation is done exactly the same way Dr. Brophy does, so far as entering the antrum. After the antrum is entered, the maxillary wall is cut away, down to the nasal wall, so that you can see the attachment in the antrum of the inferior turbinate body, which is a decided ridge, always running from before backward and downward. In this operation the nasal mucous membrane is saved. We don't go into the nose until the operation is completed. In doing this if care is taken to cut away the bone at the top of the supposed wound-to-be, going along the attachment of the inferior turbinate as far as you wish to make your opening and then tearing down the wall to the floor of the nasal cavity, we can level off, no matter whether the antrum goes below the floor of the nose or on a level with the nose, or above. In this we do not have any place for the pus to collect. After that wall is completely dissected away, the mucous membrane of the nose having been left intact, not having as yet been perforated, the floor of the antrum and the floor of the nose being on the flush absolutely, then the cavity of the nose is opened by a sagittal section through the mucous membrane, making four flaps, and the four flaps are then folded back into the antrum. It is the same thing as the Denver operation contemplates by one flap, but Denker is careless about the technic, so that he has a mucous membrane that does not attach, and therefore the antrum fills up again by granulation. If you are very particular, folding the flaps around the corners of this newly-made opening into the nose and holding the mucous membrane flaps of the nose in place by packing, the opening becomes permanent just as you leave it, and the inferior turbinate is not touched at all. In that way the dirt does not fall in, there is no mucus, there are no crusts and nobody would ever know that that antrum had been opened, although you have an opening equal in extent to the amount of bone cut away from the inferior meatal wall. The buccal cavity is closed as the last step of the operation. The packing is left in long enough for these flaps to attach, and that is all the treatment necessary. There is drainage produced and our distinguished friend, Dr. Brophy, after he produced his drainage, which he says it is essential to produce, and all that is necessary, then tells us about therapeutics. That part of the paper Dr. Robertson would criticise. There is no necessity for therapeutics. He never washes these cavities out afetr operations. He has never seen one case of scabbing, and he has never seen a case with permanent discharge, except where necrosis is extensive. He leaves the dressing in for five days; it comes out easily without tearing the flaps loose, and there is a permanent opening that does not show. And that, to the speaker's idea, is a classical operation. He has performed it for five years. He has examined these cases repeatedly to see if they remained as he left them, and they did.

The speaker believed with Dr. Brophy that we should be conservative of the nasal mucosa, because that is a most important physiological tissue in the body. It is a respiratory tissue and it is wrong to injure these tissues in any way when it can possibly be avoided.

Another thing: There is a difference between polypi and exuberant granulations. His idea is that very many cases of empyema of the maxillary sinus have no polypi at all. They are all exuberant granulations. One is a product of heat and moisture; the other a myxoma, which is a true growth.

Dr. Freer said a polypus was an inflammatory product, not a myxoma.

Dr. Robertson said it was an inflammatory polypoid edema—granuloma. He has a patient, who has been exhibited by him on various occasions, who has a bilateral empyema of the maxillary sinus of some years' duration, and her nose is still full of so-called polypi. This woman's antrum is washed out by means of the ordinary grooved Kraus cannula, and after two or three days she will blow polypi out of the nose. In a condition like that, if you produce drainage, the polypi will shrink up. Those are exuberant granulations, and as soon as you take the moisture away the things disappear. He has had several cases recently in which molar teeth were found in the antrum, one against the nasal wall in the anterior corner. The most important part of the whole operation—to get the anterior apex of

the antral cavity as clean as this—is the point most apt to present persistent granulations.

Dr. Otto T. Freer said that Claoue, of France, and Rethi, of Vienna, followed by Holbrook Curtis in America, were the first to intranasally remove a portion of the nasal wall of the maxillary antrum for the relief of empyema. Dr. Freer was the first to perform and advocate the operation in Chicago. His first case was presented to the Chicago Laryngological and Otological Society in 1904 (ILLINOIS MEDICAL JOURNAL, 1905; *Laryngoscope*, 1905). The perfected method was described in *The Journal* of the *Michigan State Medical Society*, 1912. Experience has only confirmed Dr. Freer's impression of that time, that the ideal method for the relief of chronic antral empyema is the intranasal resection with bur and trephine of a large part of the nasal wall of the antrum in the inferior meatus. Had Dr. Brophy seen Dr. Freer's results he would not have mentioned as facts theoretically reasoned evil consequences. With only rare exceptions, the patients recover in a few weeks and stay well, and Dr. Freer has seen none that suffered from the drawbacks spoken of by Dr. Brophy. After the bone wounds are healed there is no scabbing, there is no chronic mucous discharge, and the mucous membrane, both within and without the antrum cavity, looks moist, pink and healthy in all but the very rare complicated cases.

In the exceptional cases, where pus continues to come from the antrum after the operation, it usually does so because the antrum acts as a receptacle for discharge from a suppurating frontal sinus. Caries, polypi, irremediable degeneration of the mucous membrane and ulceration are conditions given a prominence in textbooks that would make them seem not unusual complications of antrum suppuration, while in reality they are extremely rare, the rule being that inspection through the intranasal opening shows the mucous lining of the antrum to be normal and not even thickened. The level of the floor of the antrum below that of the nasal cavity does not interfere enough with drainage to be of moment.

Not only does an opening through the nasal wall open the antrum into the cavity with which it is intended to communicate; that is, the nasal cavity and not the mouth, but the nasal wall of the antrum is anatomically its least important one, and it is only where direct access to the antrum is demanded for such conditions as tumors or caries that the route through the facial or, as it is also called, buccal wall should be chosen, for this highly organized wall contains the roots of the teeth and the anterior dental nerve. In fact, an opening through the facial wall is, in all but the rarest cases, an objectless mutilation.

For thsee reasons the simple operation through the nasal wall should supplant for all but complicatrd cases of chronic antrum suppuration, the needlessly formidable Caldwell-Luc, Denker and Canfield operations, which interfere with the facial skeleton and are seldom necessary. I emphasize this, because even after so many years the intranasal operation is not yet generally appreciated and patients are unnecessarily being subjected to the extensive procedures mentioned. The chief reason for the popularity of entrance to the antrum through its facial wall is the unfamiliarity of the average surgeon with intranasal work, so that the easier direct way is chosen, to the patient's detriment.

The resection of the nasal wall of the maxillary antrum in the middle meatus, practiced by some, has the serious objection that the orbit is in danger of penetration and it has been penetrated by puncture in this region. The opening obtainable in the middle meatus is a narrow slit which does not permit of inspection of the interior of the antrum, as does the opening in the lower meatus, while drainage is poor, as the opening is at the very top of the antrum. There are cases where the pus in chronic empyema clots into a mass of cheese, which lies in the bottom of the antrum and requires a large opening for its removal. The middle meatus route is not even good for diagonstic puncture with a trocar, for in washing out the antrum through the cannula of the trocar the return flow may bring clear water, the entering stream having merely flowed over the thick pus lying in the bottom of the antrum. I describe this from my own experience.

As an example, Dr. Freer relieved a young woman of a double antrum suppuration by broad openings in the lower meati after openings through the middle meati by another operator had been of no avail. The only excuse for choice of the middle meatus route is that it is an easy one.

As. Dr. Freer operates, his first opening is made for diagnosis. He is as fond of the dental engine as is Dr. Brophy, and regards it as typifying the genius of oral surgery, which Dr. Brophy has done so much to advance. General surgery can show no such beautiful instrument. A large trephine driven by the engine is introduced underneath the inferior turbinate after previous cocainization with pure cocaine in the form of flake crystals. The trephine's cutting edge is pressed against the nasal wall of the antrum as far forward in the lower meatus as possible by crowding the shank of the trephine against the flexible cartilaginous septum, which is bent over by it towards the other nostril, the trephine thus being made to cross the naris of the operation at on angle of about 45 degrees. The power is then turned on and in the usual case instantly and painlessly a smooth oval hole is made in the anteral wall large enough to permit the use of a large Eustachian catheter for washing out the antrum with plenty of room to permit the escape of clots beside the catheter. In distinction to this the trocar cannula usually employed cause great pain in making the puncture, create a stellate fracture and often fail to penetrate at all where the bone is thick in the lower meatus. In addition the cannula tightly fills the opening made, so that there is no room for a counter current beside it.

and none is possible where the natural opening of the antrum is closed by swelling or polypi.

If the diagnostic opening with the trephine brings pus from the antrum, the opening in *mild* cases, is merely enlarged underneath the lower turbinate with the trephine and bur, without cutting away any of the turbinate. This leaves hidden under the turbinate a large aperture, which is apt to close, but usually not before the suppuration has ceased. In most cases, however, in order to get a surely permanent opening, the anterior one-third to one-half of the inferior turbinate has to be resected by Dr. Freer's flap resection, which preserves the mucosa of the convexity of the turbinate, which curls into the aperture in the antrum, giving it a smooth edge above. After the turbinate resection the diagnostic trephine opening is enlarged with the bur and cutting forceps until it takes in all of the lower meatus down to the nasal floor. The mucosa of the antrum's interior is left intact and is *not curetted*. It is usually normal or capable of becoming so, if left alone. The operation leaves no denuded surfaces to granulate for the bone opening always exceeds the opening in the mucosa, which gets out of the way of the bur. In fact, it is due to concentric contraction of the mucosal opening that the aperture always loses half of its area after healing, and, if not made large enough, it sometimes closes up again by a membranous diaphragm. For this reason redundant mucosa must be cut away in the operation. The complete operation may be done under general or local anesthesia, the latter usually being employed.

Dr. Joseph C. Beck said that first he would like to object to Dr. Robertson's reference. He never said that the operation could not be done. He said he would not want to do it in that manner.

Dr. Beck enjoyed Dr. Brophy's paper immensely because it agreed with many of his own sentiments regarding the treatment of suppuration of the antrum. The one crticism that he would like to make was that not enough attention was paid to the pathologic lesions that we deal with. It makes a big difference as to the change in the tissues in a chronic suppuration of the antrum. A case may be chronic, yet, as suggested by Dr. Freer, if well opened up in the inferior meatus, will get well, because we drain and ventilate the cavity—especially is this the case if it is not associated with infections of the other sinuses.

A chronic osteitis associated with chronic suppuration of the antrum will not get well by an opening in the inferior meatus, no matter if it is as big as a house. It is a pathological process, that must be eradicated by thorough curettage and obliteration of the entire cavity. This has been his practice in cases that will not get well by an opening in the inferior meatus.

The speaker asked Dr. Rrophy what took place in that cavity when he had scraped the bone and put the plug in? Certainly not mucous membrane. It must be a scar membrane. A closed cavity lined with scar will suppurate. He said this from experience, because he has reopened these cavities.

His method of dealing with chronic suppurations, after trying simple operations, is to obliterate the cavity as nearly as possible. He has now sixteen cases on record, that have been treated and cured by this operation.

Dr. George E. Shambaugh, in speaking of the etiology of antrum infection, stated that before the development of rhinology these cases were handled almost exclusively by the dentists, and the conclusions expressed by Dr. Brophy that most of these cases are caused by dental infection corresponds with the view that was generally accepted before the advent of rhinology. Most of the cases that come under the observation of a dentist no doubt have dental origin; the dentists are consulted because of the teeth, or the patients come to the dentist because of an acute pain in the side of the face following distinctly an alveolar abscess of which the patient has been aware. The rhinologist today sees many more cases than go to the dentist; he sees not only the cases of dental origin, but those that have their origin from infection of the nose. The rhinologist has found that a relatively small percentage of cases of antrum infection have a dental origin.

The speaker in listening to the discussions was surprised that in the suggestions regarding treatment nothing had been said regarding the easiest and very often the most efficient way of making an opening into the antrum. This is by breaking through the thinnest portion of the antral wall, namely, the so-called nasal fontanelle, which lies in the middle meatus. Here there are areas of considerable size where the antrum is separated from the nose simply by the mucous membrane coverings. In an exploratory puncture of the antrum for irrigation, in making a diagnosis, this is by far the easiest and best way for entering the antrum. In cases of acute empyema of the antrum it is very unusual that one has to resort even to any artificial opening. In treating chronic cases of antrum empyema Dr. Shambaugh has been able to cure a great many cases by making a large opening in the middle meatus of the nose. In his opinion this is very often the method of choice in undertaking the cure of a chronic antrum infection. There are cases, however, where it is impossible to get a satisfactory result by working through the middle meatus. In cases where a more radical procedure is called for, the Denker operation gives us our best chance for eradicating the trouble.

Dr. J. R. Fletcher was rather surprised that nothing had been said of the bony cysts which have been shown in various works to be sometimes so enormous that they almost entirely fill the space which should be occupied by the antrum of Highmore. He is rather of the opinion that they are much more numerous than is generally thought. If we enter habitually through the canine fossa, we will now and then be dealing with a suppurating dentigerous cyst,

and have no communication except in very rare instances, when the communciation is formed by the death of the bone posteriorly. He would think that dentists would have more opportunity to find these than rhinologists, but perhaps rhinologists do not find them as often as they might because they do not look for them and keep them in mind. The speaker read a paper on this subject before the Society three or four years ago, which some of the members might remember.

He was further very much pleased to hear Dr. Shambaugh call attention to the route of the middle meatus. That is certainly the easiest point to make your entry. Oftentimes, instead of going through the elaborate procedure mentioned by Dr. Brophy to find if there is pus in the antrum, it is advisable to have an easier route, and the one spoken of by Dr. Shambaugh is the easy route. Quite a large percentage of cases are cured when we go between the middle and the inferior turbinals. He is not of the opinion that the antrum must be on the level of the inferior wall of the nose, in order to give good drainage. The head is not fixed—it is decidedly movable.

Dr. J. Holinger thought the members were dealing with a borderline subject, and of course each one finds what he is looking for on his side of the fence. Each one may have his justification. But he would call attention to the patient exhibited by Dr. Brophy. He had treated her for many months through that opening. Even though the suppuration stops temporarily, did Dr. Brophy think that he had a normal mucous membrane in there? Did Dr. Brophy make a microscopic examination of the membrane? After all the manipulations, it is impossible that there can be a normal lining of an antrum of Highmore. Sooner or later, if he allows the opening to close, the cavity will suppurate again. This is the clinical experience of rhinologists of the last twenty years, and is supported by microscopical findings.

After scraping out the mucous membrane you have nothing else to put in its place except granulations. You leave a granulating and therefore suppurating surface. Denker does not destroy any mucous membrane of the antrum except the floor, which he covers afterwards with the mucous membrane of the lateral wall between the antrum and the nose. In a week the patients are cured, and safe from relapses. Dr. Brophy treats his patients from six to nine months. The speaker's patients would not stand for that, and he would not expect it of them, so long as he can cure them in a week. If Dr. Holinger sees that after three or four washings of the antrum with boric acid solution he cannot make headway, that the discharge and odor do not diminish, he tells them to go to a hospital, where a radical operation is performed. He has never seen a suppuration recur, but even if that should happen the patient can easily wash out the antrum himself through this permanent opening. He has never seen any trouble after a Denker operation, but he has seen a lot of it after other operations.

Dr. Otis H. Maclay said the essayist had spoken of doing the work with the least manipulation and the least sacrificing of tissue, and he thought that everyone agreed with him in that, and it is only a matter of where to place this. It seemed to him that, on the basis that ventilation plays equally an important factor in the work as drainage, we do not need to get a great big opening in order to cure these cases. With a fairly good opening in the middle meatus, we run good chance of curing many of the cases, and he is of the opinion that we ought to do that first in all cases—at least give them a chance, and, if necessary, further work can be done, but the middle meatus route should be adopted first.

Dr. John A. Cavanaugh wished to call the attention of the members to a few specimens of the antrum which he has, especially as Dr. Brophy mentioned entering the antrum through the canine fossa. He has two or three specimens where the antra were very small, and in such cases this operation is absolutely impossible. The speaker had a case a year ago in which a dentist had gone through the canine fossa, thinking he was in the antrum. At first Dr. Cavanaugh thought so, too; but, the trouble persisting, he passed a probe into the opening through the canine fossa, and, looking into the nose, found that the probe passed into the lower meatus of the nasal cavity. The opening was not into the antral cavity at all.

Dr. Cavanaugh believes that all the accessory cavities that are found in the cheek bone, otherwise than the one which opens from the infundibulum, are not antral cavities, because the antrum itself develops from the middle meatus, directly from the lower part of the infundibulum. The maxillary process of the inferior turbinate forms the inner wall of the antrum, so no matter how small the antrum is, if a needle be passed underneath the inferior turbinal, about three-fourths of an inch, from the anterior end at its attachment to the lateral wall, it will always pass directly into the antral cavity, regardless of the size.

Another thing: In going through the alveolar process he has found that just anterior to the molar ridge, is the thinnest part of the anterior wall of the antral cavity, and in passing a bur or a needle upward in the direction of the suppraorbital foramen it will always pass into the antral cavity.

Dr. Brophy, in closing the discussion, thanked the members of the Society for jumping on him so lightly. However, he had this consolation that while the speakers might not agree with him, they had also failed to agree with one another.

He was greatly pleased with Dr. Robertson's remarks, and was pleased to hear that he does not destroy as much of the bony wall between the antrum and the nose as some of the others. He saves the mucous membrane and preserves the integrity of the antral cavity and of the nasal cavity. He en-

deavors to restore, in other words, what he takes away. The surgeon who has the highest aims must keep in mind the importance of preserving the anatomy of the parts upon which he operates.

Nature made this cavity for a purpose. It provides a natural opening through which air and fluids may pass. It becomes our duty as surgeons to endeavor to reestablish that opening, if by some cause it has been closed, and enable Nature to perform her functions normally. The criticism he would offer on Dr. Robertson's question is that sometimes the membrane does not reunite, and then there would be a calamity on his hands, an unnatural opening through which dust and dirt and fluids and waste and incrustations might develop. Nature provided the ostium maxillare and put it in a place where dust and dirt cannot be readily admitted, above the inferior turbinate bone, and it should be preserved or reestablished if for any reason it has been closed.

Dr. Robertson said that usually you find carious teeth where there is disease of the antrum. The speaker wished to ask, in all fairness, if the members did not think that sometimes they overlooked a tooth with a dead pulp, which was absolutely sound so far as external appearances indicated, and that the infection may have arisen from this source? He personally had no doubt of it.

How does the rhinologist know that these teeth do not contain dead pulps when the expert dentist, with all the facilities at his command, finds it difficult to determine whether the pulp in a tooth is living or dead. Part of the pulp may be living and part of it dead. Such a condition may be misleading to the observer.

It is true that a large opening through the naso-antral wall will admit of good drainage so that the constantly-forming pus at the root ends of teeth may easily escape, and inasmuch as it is not retained in the cavity the patient is not subjected to great discomfort.

Medical colleges have not taught diseases of the teeth. Medicine is said to be the healing art in all its branches. It is not any such a thing, except in part of its branches. Some few colleges are teaching dental pathology—others do not teach it at all.

Regarding Dr. Freer—there is some hope for him, because he has given up extensive cutting out of the naso-antral wall. The speaker would have been glad to give a fellow-countryman the credit for the operation, if he had known his name. He is glad that Dr. Freer uses the dental engine.

Some speaker referred to the "elaborate way" he had in opening the antrum and the more simple way of going in through the nose and around the corner. Who can do it quicker than the speaker, with this engine? You don't need to make an incision. The thinnest part of the wall is just above the canine fossa; you put the instrument in place and in a second the antrum is opened; introduce a small-pointed syringe and flush it out, and if there is any pus in there, you know it.

Dr. Beck asked what you will find in an antrum that you open and curet? In many you find nothing but pus—no membranes at all. The bone is denuded absolutely. What will happen to that kind of an antrum?

Dr. Shambaugh's plan of opening through the middle meatus is probably a most excellent one. The speaker has never tried it because he thinks he has a better way.

Dr. Fletcher spoke of dentigerous cysts and their involvement of this cavity, and of the elaborate care that the speaker pursued in opening the antrum, which is positively the quickest way. Dentigerous cysts do involve the antrum, but Dr. Brophy does not regard them as the cause of empyema, except in rare cases.

Dr. Holinger spoke of normal membrane. He does not agree with anybody else who spoke. He believes in the Denker operation.

In these old cases that have been running on for a long time, the speaker does not generally find any membrane on opening them—he finds nothing but bone denuded of all tissues.

Dr. Cavanaugh spoke of the importance of getting into the most difficult part of the antrum operation—getting into the anterior cavity. That is why Dr. Brophy opens it as he does. He can see every part of the cavity. If it is diseased anywhere, if fungi are present or exuberant granulations anywhere, he can take them out through this opening very easily.

Nothing had been said about the numerous cavities into which the antrum is sometimes divided, nor how to wash out these cavities. What better way is there of getting access to these cavities and breaking down the wall than by the methods described by the speaker? Many an antrum has been opened and treated, and then another cavity of the same antrum was filled with pus and not treated at all. What we want is to get out all the septa of bone, which will enable us to determine that we have freed the parts from infection.

Dr. Brophy then gave Dr. Maclay, the secretary, a note from Dr. Homer M. Thomas, who was to have been present to discuss his paper, which read as follows:

"Dr. Homer Thomas is unable to be at the meeting tonight, but wishes you to know that he heartily endorses your views and the position you have taken, and with you believes the only way to properly open the antrum is through the dental arch. He would be glad to have you use his name as expressing this opinion."

GALLATIN COUNTY.

Gallatin County Medical Society held its annual outing and fish fry at Round Pond, one of the beautiful lakes near Shawneetown, Wednesday, July 1, 1914.

This meeting will long be remembered as the greatest and most enjoyable in the history of the society.

An invitation had been extended to the family of

each physician to be at this meeting. The wives, children and some sweethearts came with well-filled baskets of good things suitable for the occasion.

Plenty of fish had been provided and Ben Ellis, a colored chef, had been engaged to fry the fish, make the coffee and see that everyone had plenty. You can't beat Ben when it comes to frying fish and making those about him feel jolly. When Ben calls "Dinner Time" you may be sure there is something doing. "Dinner Time" came and the long table was heaped with lots of good things besides fish, and how that bunch did eat. Too much for one sitting, so it was decided to prolong the meeting until after supper.

The day was spent in boating, bathing, fishing (fishing only), eating and social conversation.

After dinner Dr. J. A. Womack, vice-president, Dr. J. W. Bowling, president, being absent, called the meeting to order, and subjects demanding present consideration were discussed.

A committee was appointed to draft resolutions opposing the Harrison Anti-Narcotic Bill. Resolutions drafted and unanimously adopted.

All present enjoyed this meeting, but there was a feeling of sadness among the physicians because of the recent death of one of our most active members, Dr. Paul Sherman of Shawneetown, ex-president of this society.

Dr. Sherman seldom missed a meeting of the society, and then only for good cause. Proper resolutions were adopted and presented to our county papers and the ILLINOIS MEDICAL JOURNAL for publication.

Time passed quickly and "Supper Time" from Ben brought all to the table again, where ample justice was done to fish and other good things.

The annual outing and fish fry of this society will be held the first Wednesday in July of each year.

Our society is in good condition, our meetings are well attended and very profitable.

The next regular meeting will be held at New Haven, Wednesday, September 9, 1914.

ALONZO B. CAPEL, Secretary.

The following resolution was adopted by the Gallatin County Medical Society:

WHEREAS, The Supreme Ruler of the Universe has seen fit in His infinite wisdom to remove from our midst to the higher councils above Dr. Paul Sherman, of Shawneetown, Illinois; and

WHEREAS, In the death of Dr. Sherman the Gallatin County Medical Society has lost one of its most useful and active members; the county one of its best physicians; the county and state one of its best and useful citizines, and his wife and son, who are most deeply concerned of us all, a loving husband and father; therefore be it

Resolved, That while we deeply deplore the death of such a useful man, life being cut off at the meridian of its existence and the sun of life sinking beneath the western horizon just in its prime and usefulness, yet, we humbly bow to the will of Him who doeth all things well. Be it further

Resolved, That a copy of these resolutions be spread on the records of our County Society, and a copy furnished the family of the deceased, a copy furnished the county papers of this county and a copy sent to the ILLINOIS MEDICAL JOURNAL for publication.

I. A. FOSTER,
W. H. RILEY,
J. A. WOMACK,
Committee.

HANCOCK COUNTY.

The members of the Hancock County Medical Society and their wives had a delightful outing on Monday, July 6th, when tney went by automobile to Hamilton, had luncheon at the Lake View Club, after which the ladies spent the afternoon in social chat. The men held a short business session. Dr. Jenkins, who was a delegate to the State Medical meeting at Decatur, made a report. Drs. Scott and Edwards reported interesting cases and Dr. Casburn, who is leaving soon for Mississippi, gave an interesting talk about the "Hancock County Medical Society Past and Present."

The society was organized in 1850 and reorganized under the state plan in 1903. Dr. Casburn was secretary for years.

Those present were Dr. and Mrs. Jenkins, Dr. and Mrs. Blender, Dr. and Mrs. Parr, Dr. and Mrs. Frazier, Dr. and Mrs. Ferris, Dr. and Mrs. Pumphrey, Dr. and Mrs. Scott, and Dr. and Mrs. Casburn of Carthage, Dr. and Mrs. Taylor of Hamilton, Dr. and Miss Haggett of Nauvoo and Dr. Edwards of Warsaw.

JEFFERSON COUNTY.

The Jefferson County Medical Society met June 18, at the home of Dr. and Mrs. T. A. Clark in Dix, Ill. This meeting proved a most delightful affair owing to the delightful surroundings of the Clark home and the excellent preparations that had been made for the entertainment of the physician.

Dr. J. T. Whitlock presented a very interesting and able paper on "The Business Side of the Practice of Medicine." This paper was full of helpful suggestions and was followed by an extensive discussion. After this a splendid lnch was served.

The following physicians were present: Todd P. Ward, T. A. Clark, C. W. Hall, J. T. Whitlock, Thos. Williamson, Milton Freeman, C. J. Poole, O. A. Suttle, R. R. Smith, Walter Watson, W. R. Ross, J. H. Newton, A. M. Frost, L. C. Morgan, Andy Hall, A. D. Harper, and J. C. Hall.

Our society meets once every month and the programs, interest, and attendance have been excellent every month.

ANDY HALL, M. D., Secretary.

COLES COUNTY.

The Coles County Medical Society met at Charleston, Thursday, July 7, 1914. There was a good attendance of members from all parts of the county, and several homeopathic practitioners who are not members were present. It was decided to hold bimonthly meetings in the future, instead of quarterly as heretofore. There was a discussion of a revision of the Coles County fee bill, which was made out ten years ago. Many of the members were not in favor of any radical changes in the charges. The matter was placed in the hands of a committee which will report at the September meeting.

G. H. TRANSEAU, Secretary.

MADISON COUNTY.

The Madison County Medical Society met at the club house of the Country Club, Rock Springs Park, Alton, on the afternoon of July 3, 1914, with President E. A. Cook in the chair.

Members present: Drs. Lemen, W. H. C. Smith, J. H. Fiegenbaum, Cook, Burroughs, Barnsback, Hastings, Jones, E. F. Fischer, Hirsch, Range, G. K. Worden, Binney, Johnson, Theodoroff, Kiser Sims, Schreifels, J. W. Scott, Joesting, H. W. Davis, McKinney, Shaff, Pfeiffenberger, Waldo Fischer, M. W. Harrison, Haliburton, Kessinger, Beard, Luster, Wedig, Darner, Robinson, Taphorn, Duggan, Siegel, Wilkinson, and E. W. Fiegenbaum. Visitors: Capt. H. C. Pillsbury, of Jefferson Barracks, Mo.; Drs. M. A. Bliss, O. H. Brown, Walter Baumgarten, and F. M. Barnes, Jr., of St. Louis; Drs. VanHorne, Gledhill and Hunt, of Jerseyville; Dr. R. A. Fitzgerald, of Alton, and Mr. J. L. Nix, of Homer, Pa.

On motion of Dr. Lemen the courtesies of the society were extended to all of the visitors. After a very short business session, the speaker of the day, Capt. Henry C. Pillsbury, of the Medical Corps of the U. S. Army, was introduced and read a paper on "Sanitation in the U. S. Army," which was received and discussed with remarkable interest. The paper touched upon the entire field of sanitation as enforced in every army post in this and foreign countries. It took up anti-typhoid vaccination and by statistics proved its wonderful results. The extermination of mosquitoes by drainage, screening and oiling and the suppression of the fly, was thoroughly demonstrated. The speaker said that the excellent results in the Canal Zone were due to up-to-date sanitary laws strictly enforced. He particularly dwelt upon venereal prophylaxis and said that since its adoption there had been only one per cent of failure in all exposures, if applied within eight hours. The speaker was given a vote of thanks, and a motion to have the paper published in the ILLINOIS MEDICAL JOURNAL was carried.

The society then adjourned to the New Alton Mineral Springs Hotel, where a complimentary banquet was served by the hotel management, to all doctors in attendance. A detailed account of this elegant function can not be given. Suffice it to say that it will be many a day before the excellence of the feast, the good-fellowship exhibited and the general enjoyment of the occasion, will be surpassed. After a vote of thanks and appreciation to the hotel management, the meeting adjourned to meet on the first Friday in August, at the Tent Colony of Dr. M. W. Harrison, in Collinsville.

E. W. FIEGENBAUM, Secretary.

McHENRY COUNTY.

The society held its regular meeting in the Hotel Woodstock, April 30, 1914. The meeting was called to order at 10:30 a. m. by the president, Dr. H. D. Hull. Present were Drs. Joseph L. Miller of Chicago; Nason, Pillinger, Hull, Maxon, Peck, Anderson, Windmueller, West, Baccus, Francis, Thon and Smith.

The minutes of the last meeting were read and approved as read. The secretary read a letter from the secretary of the Illinois Association for the Conservation of Vision and Prevention of Blindness, asking this society to aid in holding a public lecture in Woodstock as a part of their campaign of education. It was moved and seconded that the physicians of Woodstock constitute a committee of arrangements to handle the matter as they see fit. Motion carried. The removal of Dr. J. I. Wernham, our delegate, having created a vacancy in this office, the election of a member to fill it was taken up. Dr. E. Windmueller of Woodstock was nominated and unanimously elected to fill this office for the period of two years.

Dr. Miller was then introduced by the president and gave us an interesting paper on "The Relation of Focal Infections to Rheumatism," the following being a general outline of the talk:

1. Sources of infection: (1) *Tonsils* are the most important sources; many tonsils on exterior may appear harmless, but down in crypts or behind anterior pillars may contain pus, cultures of which generally give streptococci, and these injected into animals set up an arthritis. (2) The *teeth*—(a) Especially *filled* teeth, may contain infection about the roots, and because the nerve of the tooth has been killed, the patient be unaware of trouble; granulation tissue is produced and bone absorption goes on. These can be demonstrated by x-ray films, several of which were shown. (b) *pyorrhea*, especially if extensive. (3) The *nasal accessory* sinuses must be kept in mind and looked after if necessary. (4) The *prostatic* infections, usually due to the gonococcus, but streptococcus may also be present as a secondary infection. (5) The *gallbladder*. (6) The *urinary tract* kidneys and bladder. (7) The *pharynx*, an acute pharyngitis may, by involving a large mucous surface, allow absorption of enough bacteria to cause joint infections. (8) The *intestinal tract* may play a part in some cases.

2. What can be done? Best results obtained if the primary focus can be found and removed. Sometimes a large, infected joint itself becomes a primary focus. If possible, get an autogenous vaccine from the primary focus: Give in dose of one, two or

three hundred million bacteria every seven to eight days. In case not possible to remove tonsil get a vaccine from the material in the crypts and use that. In all cases of acute rheumatism, after the attack subsides, the tonsils should be removed—this means *entire* removal—mere cutting off the top of the tonsil may cause the crypts to heal over on the surface, sealing the infectious material and make matters worse than before. The more conservative men are removing tonsils, even in patients with a high blood pressure of eg. 190 or 195 mm. In chronic cases examine tonsils carefully; if filled teeth, have x-ray films taken; if not possible to locate primary focus and get vaccine from that, a vaccine prepared from streptococci obtained from a similar case will often be found useful. Regular stock vaccines are not generally useful, as difficult to get the same strain of organism. Muscular rheumatism and neuritis cases are often due to the same causes as above. If an animal be injected with streptococci and a joint be kept cold, an arthritis is more likely to develop in this joint than in the others.

The paper was thoroughly discussed and many interesting points brought out.

It was the desire of those present that we hold the next meeting at Crystal Lake and make it the annual outing meeting. Shortly before noon adjournment was taken to the dining room.

A. B. Smith, Secretary.

The society held its fifth annual outing meeting at Leonard's Hotel, Crystal Lake, June 18, 1914. The meeting was called to order at 10:30 a. m. by the president, Dr. H. D. Hull. Members present were Drs. Goddard, Johnson, Peck, Seelye, Nason, Richardson, Wernham, Hull, Freeman, Pflueger, Guy, Windmueller, West, Francis, Baccus and Smith. Visitors were Dr. Foley of Jacksonville and Drs. Mann, Schmidt, Campbell and Bridge of Elgin.

The minutes of the last meeting were read and approved as read. The annual report of the secretary-treasurer was read; motions made and carried that it be approved and placed on file, and that a vote of thanks be extended to the secretary for his work the past year.

The following resolution was read: Resolved, That the members of the McHenry County Medical Society condemn the practice of doing contract work for any of the so-called fraternal or sick benefit societies or for factories at less than the regular rates. Proof of the violation of this to be followed by expulsion from this county society. Motion made and carried that this resolution be adopted by the society.

Motion made and carried that Dr. Goddard of Harvard be requested to give a paper at the next meeting.

Dr. Windmueller gave a report of the meeting of the Illinois Medical Society held at Decatur last month. Dr. West then gave us an interesting paper on "Parotitis: Some Observations on an Unusual Epidemic," the following being an outline of the paper:

(1) Unusual features of this epidemic: (a) Extreme contagiousness, 75 per cent of the school children and 15 per cent of the employes of the Oliver Typewriter Company contracted the disease; this was unusual, as it is not considered a highly contagious disease. (b) Severity of symptoms. This epidemic was characterized by the number of cases presenting marked symptoms. These were caused by the extreme toxemia and were pronounced in cases presenting complications. This was especially true in cases in which orchitis developed; chills, fever and sweats being pronounced, some cases having a temperature up to 104 and 105 for several days. (c) Complications are usually considered rare, but in this epidemic were common and varied; in several cases swelling of the testicle occurred simultaneously with that of the parotid; 75 per cent of the adult males developed orchitis. This metastasis, however, seemed to bear no direct relation to the amount of parotid involvement, occurring just as frequently in those with a small swelling as in those with a large amount. A severe abdominal crisis occurred in one case. Nausea and bilious vomiting were rather common and usually came as the swelling was subsiding and appeared to be due to the absorption of inflammatory products.

(2) Treatment consisted of free elimination; applications of heat and cold to the swollen glands, the former seeming to give more relief in the early stages; in the extremely toxic cases normal salt solution per rectum proved very effective.

(3) Case reports: Several of the more interesting cases were reported in detail.

The paper brought forth a pretty general discussion, which proved a benefit to all.

The following officers were unanimously elected for the ensuing year: President, Dr. A. B. Smith of Woodstock; vice-president, Dr. C. C. Peck of Harvard; secretary-treasurer, Dr. N. L. Seelye of Harvard; member of board of censors, Dr. G. H. Pflueger of Crystal Lake, making the order of this board as follows: Drs. Brown, Baccus and Pflueger.

Next meeting place announced as Harvard at a date to be arranged by the secretary.

After adjournment a social half hour was spent on the lake shore and when the dinner call came it was responded to by about forty physicians and members of their families.

A. B. Smith, Secretary.

ST. CLAIR COUNTY.

The St. Clair County Medical Society met at Prixter's Park on July 2, with all officers present and the following members: Dr. Ginsbaum and wife, Drs. Triffle, Fairbrother, Evans, Berry, Massey, Wyatt, Sr., Raab, Auten, Spannagel, Otrich, Mueller, Hansing, Gunn, Sr. and Jr., Miss Parker, Renner, Marxer, Dew, Dewey, Wilhelmy, Ronniser, Portuondo, Higgins, Steele, Lilley, Bechtold, Rayhill, Hilgard, Fulgam.

The following scientific program was rendered and

the discussion ought to show the authors that their efforts were appreciated:

1. "Traumatic Injuries to the Brain and Cord," Dr. Ronniser, St. Louis.

2. "Cystoscopic and Microscopic Diagnosis, Genito Urinary Diseases," Dr. W. Wilhelmy, East St. Louis.

Dr. Wilhelmy showed a specimen, a piece of lead pencil two inches long, which he had removed from a bladder.

3. "Radiopathy in Diagnosis of Genito Urinary Diseases," Dr. C. P. Renner, Belleville.

Dr. Renner also had lantern slides, but was unable to use them, there being no facilities in the park. He promised, however, to show them at some other time. He also presented a specimen of an injured aorta, which had been injured by a few No. 5 shots. The man lived about eight hours.

Dr. Lilley, president-elect of the Illinois State Medical Society, one of our oldest and most active members, was present and was congratulated by a resolution, which was unanimously carried. Dr. Lilly responded with a few remarks.

A motion to establish a bulletin after discussion was lost. A motion to adjourn to the "Chicken Dinner" was carried by a large majority.

AUGUST BECHTOLD, President.

Personals

Dr. Wm. L. Ballenger, Chicago, who has been incapacitated with an infected foot, has resumed his office and hospital practice.

Dr. Ralph B. McCleary, Monmouth, is reported to be seriously ill.

Dr. Andrew M. Harvey is ill with typhoid fever at the West Suburban Hospital, Oak Park.

Dr. Edgar H. Little has been appointed postmaster of East St. Louis.

Dr. Arthur L. Hagler, Springfield, who was operated on at St. John's Hospital in that city, recently, is reported to be improving.

Dr. George P. Gill, Rockford, was operated on for mastoiditis at the Wesley Hospital, Chicago, July 8.

Fire in the office of Dr. Alexander L. Blackwood, July 2, did damage amounting to $2,000.

Dr. George L. Eyster, Rock Island, while working on his automobile, was severely burned by gasoline.

Dr. George H. Lee, Kankakee, is seriously ill with septicemia, due to an infected wound of the thumb.

News Notes

—The Illinois State Board of Health is making complimentary complement-fixation tests for gonorrhea for the indigent.

—The State Board of Health has completed a sanitary survey of the summer resorts of Illinois, finding conditions at some popular summering places of great danger to the health of patrons. Notices to correct conditions have been served. After reasonable time is given to comply with the notices, reinspections will be made. Information as to the sanitary status of the resorts will be available to the public about August 10.

—The completed survey of dairies contributing to the Springfield milk supply indicated very bad conditions in 75 per cent of the 108 dairies which scored less than 50 points.

—The State Board of Health has served notices on all health officials, railway and steamboat authorities, calling attention to the bubonic plague situation at New Orleans and urging a general campaign of rat extermination and cleaning up. The board inspectors visited all ports of entry on the Ohio, Mississippi, Wabash and Illinois rivers and secured the cooperation of the various city councils in this work.

Dr. Perry H. Wessel has been reappointed city physician of Moline.

Dr. Whedon W. Mercer, a member of the staff of the Peoria State Hospital, has been appointed assistant superintendent of the Anna State Hospital.

Dr. Nathan S. Davis, who was operated on at the Presbyterian Hospital for the removal of gall-stones, June 30, has made a good recovery and is convalescing at his home in Lake Forest.

Dr. Robert P. Preble had the honorary degree of M. A. conferred on him by the University of Michigan.

Dr. R. Carl Dienst, Aurora, has been appointed surgeon and laboratory physician to the Marconi Wireless Telegraph Company, with headquarters at Mashall, Cal.

At the completion of the twenty-fifth year of service of Dr. Otis Johnston on the staff of St. Mary's Hospital, Quincy, the sisters gave a dinner in honor of Dr. Johnston, July 2. A jubilee song was sung and poems in honor of the occasion were read, and many silver gifts were presented to Dr. Johnston.

Dr. C. O. Schlaack, ambulance surgeon of the Des Plaines Street Station, was injured in a collision between the ambulance and an automobile, June 21.

Dr. and Mrs. Louis Becker, Knoxville, Drs. Wm. L. Gray, Champaign, James S. Mason, Urbana, Isaac A. Abt and family, Willis O. Nance, Franklin H. Martin, Raymond W. McNealy, John B. Murphy, Charles Davison, Wm. L. Abbott, Truman W. Brophy, E. C. Dudley and daughter, Wm. Fuller and Mrs. Fuller, George T. Tristram, Jabez D. Hammond and sons, all of Chicago, have gone to Europe.

—The New Dispensary for Sick Children, Kewanee, made possible by the efforts of the local women's club, was opened July 1 in the Lyle building on North Tremont Street.

—The new tuberculosis sanatorium for La Salle County is to be erected directly west of the men's ward of the infirmary, facing the park leading into the grounds. Work on the building, which is to cost about $3,000, will be commenced immediately.

—On June 30, the state of Illinois purchased 1,054 acres of land near Dixon, for which $216.40 per acre was paid. This will be the site of the state colony for epileptics, for which $500,000 has been appropriated. The work of erection of the building will soon be inaugurated.

—The request of the Chicago Tuberculosis Institute that it be allowed to place educational exhibits in several of the social education schools, was granted at the meeting of the school management committee of the board of education, July 17, and the institute was requested to place exhibits in as many of the schools as it deemed profitable.

—A health center for an entire township, including the towns of La Salle, Peru and Oglesby, has been established at La Salle with a high school and social center. This enterprise has been undertaken by a public-spirited citizen of La Salle. Physicians, school nurses and sanitary police will be provided, school children will be inspected, and the milk-supply of the three communities will be under control. The social settlement will include people's institutions, with swimming-pools, libraries, reading-rooms, etc.

—Fresh air stations for sick babies have been established by the Elizabeth McCormick Memorial Fund at the Northwestern University Settlement, Augusta and Robey streets, the Henry Booth House, 701 W. 14th Place, and at the House of Social Service, at 47th and Halsted streets. Dr. Frank W. Allin has charge of the medical staff of the tent system, and the nursing is under the charge of Mrs. M. Pearl Ringland of the Visiting Nurse Association. The tents are in close cooperation with the Health Department, Infant Welfare Society, Visiting Nurses, Tuberculosis Hospital and all forces working for the betterment of infant health in the city.

—Dr. L. J. Witkowski of Chicago was recently threatened by the friends of a patient who died under chloroform given to reduce a dislocation of the jaw. The doctor was provided with a police escort.

—Owing to the continually increasing amount of material of value, offering for publication in the Annals of Surgery, the publishers have found it necessary beginning with the July 1914 issue to enlarge the size of the page and also to somewhat reduce the size of type in which the original contributions have heretofore been printed. The enlarged size will also enable the publishers to make a better display of the illustrations, which are such an important feature of the Annals contributions.

Thirty years ago, when the first number of the Annals of Surgery appeared, the size and style then shown suited admirably. At that time a single number contained only 96 pages. They have continued to increase each year until now the average number of pages to an issue is 164.

The new form enables the publishers to give the reader more material and greater comfort while reading than it could have been possible for them to present in the former size.

The July issue has a choice collection of important articles of exceptional value to the general practitioner as well as the surgeon. It is a splendid example of the way this publication continues to set the pace in surgery.

—The American Roentgen Ray Society will meet in Cleveland at the Hotel Hollenden on September 9th to 12th inclusive, 1914. The program promises to be of unusual interest and value, and includes a paper by Dessauer, of Frankfort, on the subject of artificial production of gamma rays; Coolidge, the inventor of the Coolidge tube, Shearer and Duane will also

read papers. The subject of deep therapy and the production of the hard rays will be fully presented and discussed. The rest of the program will be taken up by a large number of papers on general subjects. The medical profession is cordially invited to attend these meetings.

—The Douglas Park Branch, Chicago Medical Society, passed the following resolutions:

WHEREAS, We are called upon to mourn the untimely death of our honored friend and fellow-practitioner, Dr. Harold H. Steere, suddenly called from life in the midst of its activities and in the prime of his career, at the hand of one whom he had endeavored to help,

BE IT RESOLVED, That the members of the Douglas Park Branch of the Chicago Medical Society extend to the sorrowing widow and children their deepest sympathy in this hour of trial;

That we deplore the loss of our associate and the sudden and tragic ending of a life of promise;

That we express our appreciation of his talents and abilities, his high professional standing and his many fine traits of character; and,

That a copy of these resolutions be transmitted to the bereaved family, to the Bulletin of the Chicago Medical Society and the ILLINOIS MEDICAL JOURNAL.

Committee
J. A. CLARK,
F. J. E. EHRMANN,
JAS. G. CARR.

—The campaign against the illegal sale of drugs in Chicago has involved numerous druggists, including one wholesale house and several physicians. No more contemptible business can be imagined than the sale of habit forming drugs to habitues. Physicians are naturally jealous of the professional prerogative of prescribing, but no sympathy will be wasted on those who fall foul of the law.

—The village board of Wilmette refused to grant a license to Dr. L. C. H. E. Zeigler, Chicago, to build a hospital in that village.

—The appellate division of the New York supreme court sustained the conviction of Willis Vernon Cole, a Christian Science healer, for practicing medicine without a license. Defense was made on the plea that Cole did not "charge" for his services, but accepted fees offered him. He testified that his "practice" brought him an income of $6,000 a year. Who wouldn't abuse the devil "like hell" for that?

—The trustees of the American Medicine Gold Medal Award announce that the medal for 1914 has been conferred upon Dr. George W. Crile of Cleveland, as the American physician who in their judgment has performed the most conspicuous and noteworthy service in the domain of medicine and surgery during the past year.

—The Robert Koch Society for the study of tuberculosis met Thursday, July 16, under the auspices of the Chicago Tuberculosis Institute at the City Club, Chicago. Sixty nurses and physicians listened to the following interesting program:

Subject: "Tuberculosis of Bones and Joints. The Present Status."

Speakers: Dr. Charles M. Jacobs, Etiology and Pathology.

Dr. John L. Porter, Non-Surgical Treatment.

Dr. Edwin W. Ryerson, Surgical Treatment.

Dr. John Ridlon opened the Discussion.

PUBLIC HEALTH.

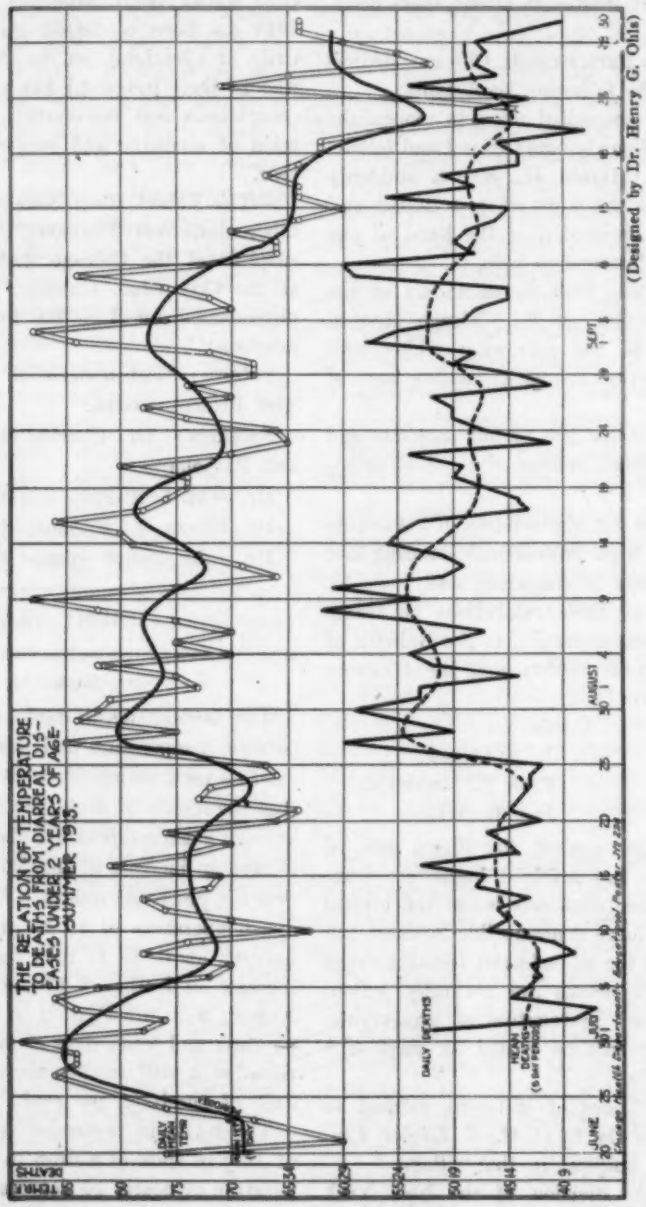
HOT WEATHER AND DEATHS FROM DIARRHEAL DISEASES.

The accompanying table shows the relation between temperature and deaths from diarrheal diseases each month in 1913. It will be noted that the month of June, the first month with an average mean temperature above 70 F. (70.6 F.) showed an increase of only 25 per cent. in deaths over the preceding month. But July, with average temperature of 70 F. and fewer days with maxima above 85 F. than had June, showed an increase in deaths of 130 per cent. over June. August, with 0.7 F. drop in average mean temperature and fewer days of maxima above 85 F., recorded a still further increase in deaths over July of nearly 25 per cent.

The deaths in September remained above those of July in spite of a drop in average mean temperature of nearly 10 degrees and less than one-third as many days of maxima above 85 F. These figures confirm the usual experience that babies who survive high temperature in early summer succumb in greatly increased numbers to the

conditions that prevail later in the summer, even though the temperature is much lower. It is probable that it is not alone the hot weather per se, irrespective of previous and related conditions, that determine the fatal issue. It would seem that the long-continued heat of summer has a cumulative effect which reduces the infant's resistance to the possible infections from spoiled food.

Extended studies of infant feeding under varied conditions of temperature and ventilation have shown that infants on breast milk have a lower death-rate than infants with the best-managed substitutes. When the artificial food is further subjected to the vicissitudes of age, contamination and high temperature, the infant's chance of surviving is small indeed.



No study of temperature and infant feeding

should overlook the fact that the "official" temperature with a high daily minimum and comparatively low night minimum is different from the conditions that exist in steamy, unventilated tenements crowded thickly in back lots where the high temperature is never relieved by friend Lake Breeze.

Schereschewsky's article on this subject in U. S. Public Health Reports, Dec. 5, 1913, quoted from German authorities to the effect that in many cases the indoor temperature in workmen's dwellings exceeded the outdoor summer temperature. In some cases the indoor temperature remained higher than the outdoor for over fourteen days continually and at one time was over 20 degrees higher. It is easy to understand that cooking, washing and ironing can easily cause this difference. Moreover, the increased humidity under such circumstances would add vastly to the depressing effect of the high temperature.

The cut in this Bulletin also shows graphically the relation between temperature and deaths from diarrheal diseases under two years of age during the summer of 1913. The death curve shows an initial rise about ten days after the high temperature in June and for the balance of the summer the two curves are fairly parallel.

HOT WEATHER AND DIARRHEAL DEATHS

1913—	Deaths	Aver. Mean Temp.	Days of Max. Temperature Above 80 F.	Above 85 F.	Above 90 F.
Jan.	145	29.3	0	0	0
Feb.	143	24.8	0	0	0
March	204	35.2	0	0	0
April	176	48.8	0	0	0
May	164	57.6	3	0	0
June	206	70.6	15	12	7
July	474	75	19	10	7
August	591	74.3	14	9	4
Sept.	511	65.4	6	3	3
Oct	264	53.5	1	0	0
Nov.	169	47.2	0	0	0
Dec.	167	37.4	0	0	0
Total	3,214				
Av. Mon.	268				

From Bulletin Chicago Department of Health.

Marriage

DREXEL LOWRY DAWSON, M. D., to Miss Lula Sinclair, both of Chicago, recently.

MORRIS FISHBEIN, M. D., Chicago, to Miss Anna Mantel of Indianapolis, July 7.

ROSS WILLIAM GRISWOLD, M. D., to Miss Camilla Seymour, both of Litchfield, Ill., May 27.

FRANKLIN EUGENE HAGIE, M. D., Elizabeth, Ill., to Miss Nellie Wells Rae of Chicago, June 30.

THOMAS HAROLD REAGAN, M. D., Canton, Ill., to Miss Bertha Rhenstrom, in Chicago, June 18.

DAVID HENRY WHERRITT, M. D., Chicago, to Miss Elizabeth Griffith of New Orleans, June 23.

PAUL HENRY ANTHONY, M. D., to Miss Mary Wendolyn Fitzgerald of Chicago, June 30, 1914.

Deaths

WILLIAM WAYLAND BONNELL (license, Illinois, years of practice, 1878); died recently at his home in Astoria, Ill.

HARRY H. CARNES, M. D. State University of Iowa College of Homeopathic Medicine, Iowa City, 1888; of Champaign, Ill.; died in a hospital in Peoria, Ill., June 8, from disease of the liver, aged 54.

ALBERT S. CLARKE, M. D. New York University, New York City, 1848; died at his home in Bushnell, Ill., May 13, from senile debility, aged 90.

L. W. CLARK (license, years of practice, Illinois); for many years a resident of Rushville, Ill.; died in Carterville, Mo., May 7, from acute gastritis, aged 72.

ARTHUR HURTADO DE MENDOZA, M. D. Dearborn Medical College, Chicago, 1905; of Piper City, Ill.; died suddenly from cerebral hemorrhage while making a professional call near La Hogue, Ill., June 12, aged 50.

PAUL SHERMAN, M. D. St. Louis College of Physicians and Surgeons, 1898; a Fellow of the American Medical Association; and an inspector for the Illinois State Board of Health; died at his home in Shawneetown, Ill., June 19, from nephritis, aged 38.

HAROLD HAINES STEERE, M. D. Hering Medical College, Chicago, 1903; College of Phy-

sicians and Surgeons, 1908; a member of the Illinois State Medical Society; was shot by a patient in his office in Chicago, July 13, and died a few hours later at St. Anthony's Hospital, aged 40.

Book Notices

MODERN MEDICINE. ITS THEORY AND PRACTICE. In Original Contributions by American and Foreign Authors. Edited by Sir William Osler, Bart., M. D., F. R. S., Regius Professor of Medicine in Oxford University, England; Honorary Professor of Medicine in Johns Hopkins University, Baltimore; formerly Professor of Clinical Medicine in the University of Pennsylvania, Philadelphia, and in McGill University, Montreal; and Thomas McCrae, M. D., Professor of Medicine in the Jefferson Medical College, Philadelphia; Fellow of the Royal College of Physicians, London; formerly Associate Professor of Medicine in Johns Hopkins University, Baltimore. In five octavo volumes of about 1,000 pages each, illustrated. Volume III. Diseases of Digestive System—Diseases of the Urinary System. Just ready. Price per volume, cloth, $5.00, net; half morocco, $7.00, net. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

This third volume of Modern Medicine just off the presses of Lee & Febiger treats exclusively of the diseases of the digestive system and of the urinary system.

The various chapters are written by several of the best known medical men in this country and in England.

This "colossal work" edited by Osler and McCree, is, we think, the best system of medicine of which we have knowledge. This volume is one of the most interesting of the set—dealing as it does with the organs of digestion and excretion.

No physician practicing medicine can afford to do without this especially valuable work.

THE PRACTICAL MEDICINE SERIES comprising ten volumes on the year's progress in medicine and surgery—under the general editorial charge of Charles L. Mix, A. M., M. D., professor of physical diagnosis in the Northwestern University medical school Robert T. Vaughn, Ph. B., M. D.

Volume I. General Medicine, edited by Frank Billings, M. S., M. D. Head of the medical department and Dean of the faculty of Rush Medical College, Chicago, and J. H. Salisbury, A. M., M. D., professor of medicine, Illinois Post-Graduate Medical School—Series 1914. Price $1.50.

Volume II. General Surgery, edited by John B. Murphy, A. M., M. D., LL.D., F. R. C. S. England (Hon.), F. A. C. S., President of the International Surgical Congress, London; Professor of Surgery in the Northwestern University; Attending Surgeon and Chief of Staff of Mercy Hospital and Columbus Hospital, Consulting Surgeon to Cook County Hospital and Alexian Brothers Hospital, Chicago. Series 1914. Price $2.00.

Volume III. The Eye, Ear, Nose and Throat, edited by Casey A. Wood, C. M., M. D., D. C. L. Albert H. Andrews, M. D., William L. Ballenger, M. D. Series 1914. Price $1.50.

The Practical Medicine Series are too well known to require comment. The first three volumes are just from the presses of "The Year Book" publishers and in each volume is discussed that which is new in the years' work of each of the specialties. The names of the editors of the several volumes are well-known and in each instance is a criterion of the contents of that volume. The volumes may be purchased singly—or the entire series of ten volumes may be had for ten dollars. Chicago—The Year Book Publishers, 327 S. LaSalle Street.

HOSPITAL OF THE PROTESTANT EPISCOPAL CHURCH IN PHILADELPHIA. Medical and Surgical Reports of the Episcopal Hospital, Volume II. Philadelphia Press of Wm. J. Dornan, 1914.

In addition to being a regular business statement of hospital affairs and conditions, the book contains many case records of many especially interesting cases coming under the service of the attending staff.

DISEASES OF THE RECTUM AND COLON AND THEIR SURGICAL TREATMENT. By Jerome M. Lynch, M. D., Professor of Rectal and Intestinal Surgery, New York Polyclinic; attending Surgeon, Cornell Dispensary; Fellow of the American Proctologic Society, New York Gastro-Enterological Society, etc. Octavo, 583 pages, with 228 engravings and 9 colored plates. Cloth, $5.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

No branch of medicine or surgery is so grossly neglected as pathological conditions of the rectum. Perhaps no part of the human anatomy is so frequently in need of one or the other as the rectum.

This volume from Dr. Lynch will undoubtedly fill the need of many doctors, who want the latest literature on this subject. It seems to cover the entire field of rectal and colonic diseases and conditions.

The systematic arrangement, the fine quality of the illustrations, together with the excellent text, makes it a book that any physician may read with benefit—we heartily recommend it.

A HANDBOOK OF PSYCHOLOGY AND MENTAL DISEASE for use in training schools for attendants and nurses and in medical classes and as a ready reference for the practitioner, by C. B. Burr, M. D. Medical Director of Oak Grove Hospital (Flint, Mich.), for Mental and Nervous Diseases; formerly Medical Superintendent of the Eastern Michigan Asylum; member of the American Medico-Psychological Association, of the American Medical Association, of the American Neurological Association, of the Detroit Society of Neurology and Psychiatry; corresponding Fellow of the Detroit Academy of Medicine; Foreign Associate Member of Société Medico-Psychologique of Paris, etc. Fourth edition, revised and enlarged, with illustrations. Philadelphia, F. A. Davis Company, Publishers English Depot; Stanley Phillips, London, 1914.

A very useful little volume has come from the F. A. Davis Company in the third edition of Psychology and Mental Diseases, by C. B. Burr. In it are studied insanity in its various forms, the management of insane patients, and the nursing of those unfortunate. It treats all of the subjects briefly, but very clearly, and the general practitioner who can not, for lack of time go into these questions deeply, will find this book decidedly useful.